ANALYTICAL SYSTEMS

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Lesman handles instruments for your process that run from the most simple to the most advanced. Look here for assistance finding the exact model to meet your process needs: approval certifications for your environment, materials that offer chemical resistance and long life, configuration and mounting styles that meet your mechanical requirements.

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Some products are not available in all Lesman markets or geographic areas.

Prices in this catalog are current at the publication date, and are subject to change without notice.

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

pH/ORP Replacement Probes

AquaMetrix pH probes plug right in, to replace your GLI/Hach pH sensors!

Get an easy, drop-in pH sensor, with the same performance specifications as the Great Lakes probes you're currently using, and save time, money, and hassles on every order!

Plus, you'll save on inventory costs. Just look below: One AquaMetrix pH probe model and one AquaMetrix ORP sensor replace 16 different Great Lakes sensor models. So, you only have to stock one or two part numbers for quick, easy replacements in your applications!

If you're having problems getting delivery of Great Lakes probes, we have great news! Lesman stocks the most popular models of AquaMetrix probes — so you can have replacement probes as soon as the next business day. Just place your order before 3pm Central Time, and your in-stock probes will ship the same day.

Quick GLI to AquaMetrix Part Number Crossover

pH Sensors		*ORP Sensors*	
GLI Part Number	**AquaMetrix Part Number**	**GLI Part Number**	**AquaMetrix Part Number**
6020P0	P60C8	2020R0	R60C8
6021P0	P60C8	2021R0	R60C8
6022P0	P60C8	2022R0	R60C8
6026P0	P60C8	2026R0	R60C8
6028P0	P60C8	2028R0	R60C8
6052P0	P60C8	2052R0	R60C8
6056P0	P60C8	2056R0	R60C8
6058P0	P60C8	2058R0	R60C8

Specifications

Measuring Range: *pH:* 0 to 14.00 pH (consult factory for applications below α 2 and above α 12); *ORP:* -2000 mV to 2000 mV

Flow Rate: 10 ft/sec max (3 meters/sec).

Wetted Materials: CPVC, ceramic/kynar, glass, titanium palladium alloy and EPDM (platinum for ORP probe)

Transmission Distance: 3000 feet max

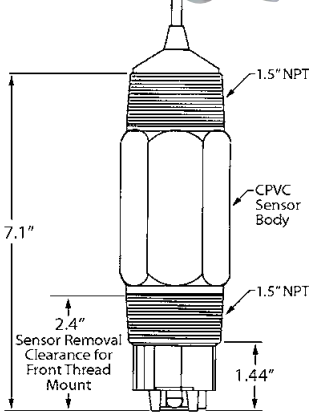
Sensitivity: *pH:* <0.005 pH; *ORP:* 0.5 mV

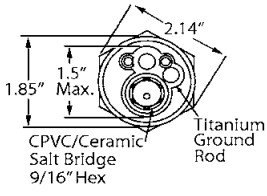
Stability: 0.03 pH/day, non-cumulative

Automatic Temperature Compensation: Within temperature limits 23° to 203°F

Pressure Limit: 100 PSIG at 65°C max

Temperature Limits: *CPVC:* 23° to 203°F





Features

- Accurate differential measurement
- Eliminates ground loop interference
- Built-in preamplifier
- Replaceable salt bridge
- Temperature compensation device built into all sensors

The P60C8 pH and the R60C8 ORP probe are dependable industrial grade sensors designed to provide accurate measurement and longer service life under the most demanding conditions.

The 60C8 incorporates all the benefits of three-electrode differential measurement. The domed glass process electrode is designed for use in tough applications. The second electrode is immersed in a pH 7 buffer that is fully encapsulated in the probe. This second electrode is protected from the process by a double junction salt bridge.

The resulting true differential measurement has many advantages over conventional probes: ground loop problems are virtually eliminated, and the salt bridge is easy to replace. If the internal solution becomes contaminated, the probe can be rejuvenated by replacing the salt bridge and reference solution.

A thermistor at the probe's tip performs automatic temperature compensation. This placement provides rapid response for process temperature variations.

The encapsulated preamp provides an output signal that can be transmitted 3000 feet. Another version encapsulates a blind 4 to 20 mA two-wire transmitter that can transmit a virtually unlimited distance over a twisted pair cable.

Model Selection Guide

Description		Catalog Number	Price
60 Series Differential pH Sensor		P	$545.00
60 Series Differential ORP Sensors		R	545.00
Electronics	Standard 5-Wire Sensor	60C	0.00
	Two-Wire Transmitter, 4-20 mA Output	65C	125.00
Body	1.5" NPT Threaded (GLI Replacement Sensor)	8	0.00
	GLI 605IPO Replacement (Sensor Only)	4	0.00
	Fixed Insertion, Sanitary 2.5" Tri-Clover Fitting	S	95.00
Options	Hardened Glass Electrode	H	50.00
	Flat Faced Glass Electrode (Sanitary Body)	F	50.00
	Gold Electrode for ORP Sensors	G	50.00
Cable	Extended Cable Length (in Feet)	XXX	50.00 +1.50/ft
Mounting Hardware and Accessories			
Salt Bridge Kit, Ceramic Outer Junction, 3-Pack for -8 Body Type (GLI Replacement Sensors)		AM60-9765	90.00
Salt Bridge kit, Kynar Outer Junction, 3-Pack for -8 Body Type (GLI Replacement Sensors)		AM60-9765K	90.00
Union Tee with Adapter for -8 Body Type		AM-MH538N9A	195.00
Submersion Hardware		STC60L	115.00
Salt Bridge Kit, Ceramic Outer Junction, 3-Pack		C35-17	90.00
Salt Bridge Kit, Kynar Outer Junction, 3-Pack		C35-17K	90.00

Normally Available from Lesman Stock! **P60C8** **P60C8H**

Shark Series Multivariable Transmitters and Analyzers

Features

- Measures pH, ORP, conductivity, and flow right out of the box — no extra cards or options needed!
- 1/4 DIN enclosures
- SharkTX and SharkTXP transmitters feature 4-20 mA + 24 VDC loop power, 2x16 character LCD display; NEMA 4X enclosure or front panel
- Shark-120 analyzer/controllers feature 4-digit LED with colored bargraph, relay cycle on/off timers; two control relays and high/low alarm relay, two 4-20 mA outputs, snap-on terminal connectors

AquaMetrix' SharkTX is the only 1/4 DIN and DIN-rail mountable two-wire transmitter on the market that lets monitor conductivity, pH, ORP, or flow. Just select the variable from the front panel. It features a single, isolated, independent, fully scalable 4-20 mA output.

The Shark-120 is designed to be the most flexible, easy-to-use, multiparameter analyzer/controller on the market.

Just select the parameter you want to measure from the LCD menu on the inside front cover. Choose from conductivity, pH, ORP, or flow.

Shark-120 gives you access to two displays. A bright LED numeric display with a bargraph on the outside front panel, and a two-line, 16-character LCD display on the inside. The LED readout can be seen from several yards away. The distinctive color-coded bargraph makes diagnosing pump and alarm malfunctions easy. It will immediately indicate if you are within the process parameters you've set (green), if the control relays are on (yellow), or if the process is in alarm conditions (red).

All configuration and control functions are performed on the LCD menu inside the front panel. You'll also be able to perform calibration functions and check temperatures (where applicable) from the front panel LED.

Since this routine maintenance doesn't require opening the front panel to access the main menu, configuration settings can't be changed by mistake. You can perform process and temperature calibration from the LCD menu, where calibration slope, temperature, and efficiency are displayed.

Shark controller/analyzers provide control of external devices using two independent control relays. A third relay is preset to act as an alarm, but can also be used as a process control relay. It has both high and low ON setpoints, with adjustable OFF setpoints.

Factory-set for bidirectional control, both control relays can be set for either rising or falling process, with easily programmed On and OFF setpoints. Each control relay has a built-in independent cycle timer, with field-set ON and OFF times. This feature enables tighter control of batch processes by eliminating chemical overshoot.

Shark-120 comes in a rugged NEMA 4X polycarbonate enclosure, making it ideal for heavy-duty applications, such as industrial wastewater neutralization, municipal water and wastewater, pulp and paper, and process control.

Specifications

	pH	ORP	Conductivity	Flow
Measuring Range	*pH:* 0.01 to 14.00; *Temp:* 0° to 100°C/32° to 212°F	*ORP:* -1999 to 1999mV; *Temp:* 0° to 100°C/32° to 212°F	uS/cm: 0 to 2.000, 0 to 20.00, 0 to 200.0, 0 to 2000; mS/cm: 0 to 20.00, 0 to 200.0; MΩ/cm: 0 to 19.99; Temp: 0° to 100°C or 32° to 212°F	Flow: 0 to 9999, selectable flow rate units (gallons, cubic feet, liters, cubic meters, custom); Volume: 0 to 9999, auto range: Time units: Hours, minutes, seconds
Calibration	Auto, manual, temperature	Manual, temperature	Dry, sample, temperature	K factor Input
Sensor Distance	Differential: 3000 ft; Combination: 10 ft		300 ft	2000 ft

Analog Output (SharkTX and SharkTXP): 4-20 mA Isolated Output, Range expand 0–100% full scale (min segment 10% full scale), max. load 800Ω

Analog Outputs (Shark-120): *4 to 20mA Channel 1:* Isolated Output, Range expand 0–100% full scale (min segment 10% full scale), max. load 800Ω; *4 to 20mA Channel 2:* Isolated Output, Range expand 0–100% of full scale (min segment 10% full scale), max. load 800Ω; Can be set to track temperature if sensor is equipped with a temperature sensor

Relay Outputs (Shark-120 Only): *Two Control Relays:* 10A/NO, 5A/NC @ 240VAC or 28VDC. Mode: Process control, Adjustable parameters: process direction, (rising or falling) On/Off setpoints, (0 to 100% full scale), cycle timer (on/off, 0 to 600 seconds), failsafe (on/off). *One Alarm Relay:* 10A/NO, 5A/NC @ 240VAC or 28VDC. Mode: High/low alarm, Adjustable parameters: High/Low on/off setpoints (0 to 100% full scale).

Ambient Conditions: *Temperature:*-4° to 140°F; *Humidity:* 0 to 90% RH (non-condensing)

Power Requirements: *SharkTX/SharkTXP:* 4-20 mA loop powered, 16 to 32 VDC; *Shark-120:* 120VAC 50/60Hz (<12VA) or 240VAC 50/60Hz (<12VA)

Display: *SharkTX/SharkTXP:* 2 x 16 alphanumeric LCD; *Shark-120:* 4 x 7 segment 1/2" LED, 1 LED indicator online, 7 LED bargraph on front panel, 2 x 16 alphanumeric LCD inside panel

Enclosure: *SharkTX:* NEMA 4X polycarbonate enclosure, two 1/2" conduit holes; *SharkTXP:* NEMA 4X front panel, 1/4 DIN polycarbonate; *Shark-120:* NEMA 4X polycarbonate enclosure, four 1/2" conduit holes

Mounting: *SharkTX, Shark-120:* Universal Mounting kit for surface, pipe and panel mount included; *SharkTXP:* Panel and DIN rail mount included

Approvals: ULC (pending)

Model Selection Guide

Description	Catalog No	Price
Multiparameter Transmitter, Panel/Pipe/Surface Mt	SharkTX	$475.00
Multiparameter Transmitter, Panel/DIN Rail Mount	SharkTXP	450.00
Multiparameter Controller/Analyzer, 120V Power	Shark-120	970.00

Call Lesman for available cells, probes and sensors.

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

Choosing the Right pH/ORP Analysis System

pH/ORP Analysis, Control, and Monitoring Devices

	DirectLine™ Model DL421 with Durafet II Sensor	APT2000/4000 pH Transmitter/Analyzer	UDA2182 Analyzer/Controller
Measurement	pH	pH/ORP	pH/ORP
Case	Plastic Polycelfoam enclosure, IP66, H 4.84" x W 1.89" x D 1.81"	Plastic enclosure made of PBT NEMA 4X, IP65 rating	GE Valox® 357 plastic CSA Type 4X/NEMA 4X rating
Display	LCD 4-digit, 7-segment	7-segment LCD display	Backlit LCD, 128x64 pixels
Display Accuracy	pH: ±0.02; temperature: ±0.1° C/F	pH: ±0.02; Temp ±0.01° C/F	±0.5% reading
Control Capabilities/ Advanced Features	Integral electronics/sensor design, one or two point calibration, Auto Buffer Recognition	Electronics sensor and diagnostics, Auto Buffer Recognition, HART Communications option	PID, duplex, On/Off control AccuTune II, fuzzy logic overshoot Auto Buffer Recognition (US, NIST, Euro)
Operating Conditions	-4° to 185°F (-20° to 85°C)	-4 to 131°F (-20° to 55°C)	32° to 140°F (0° to 60°C)
Operating Voltage	16 to 42 VDC	2000: 14 to 40 VDC; 4000: 20 to 253 VAC/DC	90-264 VAC
Analog Outputs	One 4 to 20 mA	One 4 to 20 mA	Up to three 0 or 4 to 20 mA
Relays	N/A	2000: N/A; 4000: Hi/lo alarm relays	Up to 4 SPDT (Form C) relays
Mountings	Integral: no electronics mounting needed; Remote: pipe, wall or DIN rail	Pipe, wall or panel	Pipe, wall or panel
Approvals	CE; General purpose: UL; CSA; FM Class 1, Div 1, Groups A-D (1.5); FM Class I, Div 2, Groups A-D (N.I. Field Wiring)	CE; FM Class I, Div 2; FM Class 1, Div 1 IS & CENELEC	CE, UL/CSA General Purpose FM Class I, Div 2

pH/ORP Sensors

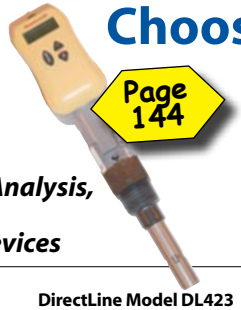
	Durafet ® III Glass-free unbreakable electrode	Meredian II for pH and ORP Glass electrode for general service	HB Series for pH/ORP Glass electrode for harsh conditions	HPW7000 Hi-pHurity System
Measurement Range	0 to 14 pH	0 to 14 pH, 1999 to 1999 mV (ORP)	0 to 14 pH	4 to 10 pH
Temperature Range	14° to 266°F (-10° to 130°C)	32° to 230°F (0 to 110°C)	Good to 284°F (140°C)	-4 to 302°F (-20° to 150°C)
Materials	Ryton body, silicon ISFET die electrode, ceramic reference junction, Viton media seal, EPDM reference seal	Ryton body, glass electrode, EPDM seals ORP model has gold/platinum electrode	CPVC, Polypropylene or Ryton body Viton or EPDM O-rings, glass (pH) or platinum (ORP) electrode, Teflon junction	136L SS
Special Features	Response time 10 times faster than glass, replaceable reference junction		Axial ion path technology eliminates leak pathways and breakage	0.1 pH accuracy in process with conductivity <10µS/cm

Mountings

Style	7773 Mounting	7774 Mounting	7777 Mounting	7794DVP Mounting	7758 Mounting
Measurement Range	0 to 14 pH; ±1600 mV ORP	0 to 14 pH; ±1600 mV ORP	0 to 14 pH; ±1600 mV ORP	0 to 14 pH	0 to 14 pH; ±1600 mV ORP
Pressure and Temperature Ratings	Immersion: Polypropylene- 100 psig at 140°F, 316 SS: 100 psig at 176°F, Flowthrough: Polypropylene- 100 psig at 140°F, 316 SS: 150 psig at 176°F	316 SS: Determined by electrode; CPVC: 100 psig at 122°F (689 kPa at 50°C)	100 psig at 122°F (Up to 689 kPa at 50°C)	100 psig at 212°F (Up to 689 kPa at 100°C)	316 SS: 150 psig at 212°F (1034 kPa at 100°C) Polypropylene: 100 psig at 95°F (689 kPa at 35°C)
Materials	Polypropylene, Ryton or 316 SS	Ball valve, mounting nipple, extension tube, 316 SS or CPVC O-rings: EPDM & Viton	Durafet II & glass electrode bodies: Ryton	Body: Polysulfone	316 SS cover, wetted 316 SS or polypropylene bushings, Viton o-rings
Special Features	Allows separate measuring and reference electrodes in one mounting	Insertion/removal under pressure without interrupting process		Sanitary 3-A approval for food and dairy applications	Allows variable immersion depths in pipe
Mountings	Immersion or flow-through	1 1/4" NPT (316 SS) or 1 1/2" NPT (CPVC) pipe nipple through ball valve	Immersion or in-line tee (3/4" NPT fitting)	1 1/2", 2", or 3" tri-clamp flange mounting	3/4" NPT bushing

Need help? Fill out a Honeywell analytical instruments datasheet at www.Lesman.com/datasheets and fax it to Lesman.

Choosing the Right Conductivity Analysis System



Conductivity Analysis, Control, and Monitoring Devices

	DirectLine Model DL423	UDA2182 Dual Input Analyzer/Controller	APT2000/4000CC Contacting Conductivity Transmitter	APT2000/4000TC Toroidal Conductivity
Case	Plastic Polycelfoam enclosure, IP66, H 4.84" x W 1.89" D 1.81"	GE Valox® 357 plastic CSA Type 4X/NEMA 4X rating	Plastic enclosure made of PBT NEMA 4X, IP65 rating	Plastic enclosure made of PBT NEMA 4X, IP65 rating
Display	LCD 4-digit, 7 segment	LCD dot matrix, 128x64 dpi,	7-segment LCD display	7-segment LCD display
Display Accuracy	Conductivity/resistivity: greater of ±2 counts or ±0.5% of reading Concentration: ±0.5% of reading Temperature: ±0.1%C from -10 to 99°C, ±1°C from 100 to 140°C	0.5% of reading	Conductivity: 1% of measured value or ± (-0.4 µ/cm* cell constant)	Conductivity: (1% of measured value) ±(0.2 µ/cm ±1 Significant digit)
Advanced Control Capabilities/ Features	Integral electronics/sensor design; trim valve or 1 pt solution calibration	PID, duplex, on/off control, AccuTune II, fuzzy logic overshoot suppression, USP26 alarm, solution temperature compensation	Measures conductivity, resistivity or salinity, electronics & sensor diagnostics, HART comm. option	Measures conductivity or chemical concentration; electronics & sensor diagnostics, HART comm. option
Operating Con.	-4° to 185°F (-20° to 85°C)	32° to 140°F (0° to 60°C)	-4 to 131°F (-20° to 55°C)	-4 to 131°F (-20° to 55°C)
Operating Voltage	16-42 VDC	90-264 VAC	2000: 14-42 VDC; 4000: 20-253 V AC/DC	2000: 14-42 VDC; 4000: 20-253 V AC/DC
Analog Inputs	One 4 to 20 mA	Up to three 0 or 4 to 20 mA	One 4 to 20 mA	One 4 to 20 mA
Relays	None	Up to 4 SPDT (Form C) relays	2000: N/A; 4000: Hi/lo alarm relays	2000: N/A; 4000: Hi/lo alarm relays
Mountings	Integral, no electronics mounting; Remote: pipe, wall or DIN rail	Pipe, wall or panel	Pipe, wall or panel	Pipe, wall or panel
Approvals	Industrial: CE ; General: UL/CSA, FM	CE, UL/CSA General; FM Class I, Div 2	CE, FM Class 1, Div 2; FM Class 1, Div 1	CE, FM Class 1, Div

Conductivity Cell Assemblies and Sensors

	4973 Contacting	4974 Contacting	4905 Contacting	4909 Contacting	5000 TC Toroidal
Measurement Range	0.01, 0.1, 1.0, 10.0 cell constants		0.01, 0.1, 10.0, 25 & 50 cell constants		0.2 to 200 µ/cm
Pressure & Temp Ratings	250 PSI at 284°F	150 PSI at 257°F	250 PSI at 284°F	SS: 3.45 bar at 140°C (50 PSI at 284°F) CPVC: 2.07 bar at 140°C (30 PSI at 284°F)	*see note
Materials	Titanium or graphite	Titanium or graphite with food-grade silicone rubber and polished 316 SS	Nickel or platinum	Nickel or platinum	Polypropylene, PVDF PEEK, PFA teflon
Mounting	3/4" NPT thread fitting	1 1/2" or 2" Tri-clover clamp	1" NPT threaded fitting	CPVC or SS; allows insertion/ removal of cell without stopping process	Immersion, union, sanitary 2" flange or insertion/removal

* Polypropylene: 100 PSI at 212°F (6.9 bar at 100°C) PVDF: 100 PSI at 248°F (6.9 bar at 120°C) PEEK: 200 PSI at 302°F (13.8 bar at 150°C) PFA Teflon: 200 PSI at 302°F (13.8 bar at 150°C)

Choosing Your Dissolved Oxygen Analysis System

	DL424 ppm, DL425 ppb	UDA2182 Analyzer/Controller
Case	DIN size aluminum, NEMA 4X/IP65	DIN size, GE Valox® case, NEMA 4X
Display	Backlit dot matrix LCD	Backlit LCD 128x64 pixels
Display Accuracy	0.01ppm; 0.1 ppb in 0-20 ppb range, 1.0 ppb in 0-200 ppb range	±0.5% reading
Operating Conditions	-4° to 185°F (-20° to 60°C)	32° to 140°F (0° to 60°C)
Control Capabilities/ Advanced Features	Integral electronics/sensor design	PID, duplex, on/off control, AccuTune II, automatic altitude and salinity compensation
Operating Voltage	16-42 VDC	90-264 VAC
Analog Outputs	One 4 to 20 mA	Up to three 0 or 4 to 20 mA
Relays	N/A	Up to four SPDT (Form C) relays
Mountings	Pipe, wall and panel	Pipe, wall and panel
Approvals	UL and CSA general purpose	CE, UL/CSA General; FM Class I, Div 2,

DL5000 Equilibrium probes for ppm or ppb applications	
Materials	316 SS or CVC housing
Measurement Range	0 to 25,000 ppb or 0 to 25 ppm
Temperature Range	35.6° to 140°F (2° to 60°C)
Pressure Ratings	316 SS: 50 PSI (345 kPa) CPPVC: 30 PSI (207 kPa)
Special Features	No internal probe maintenance
Mountings	Immersion, in-line or sample flow chamber
Dimensions	1" NPT pipe, 20 ft waterproof cable

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
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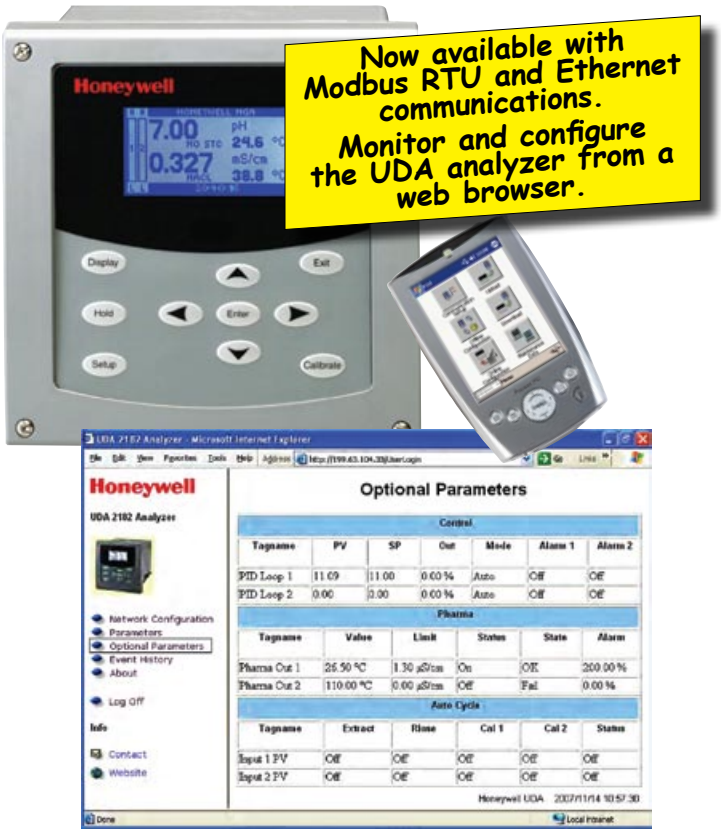
UDA2182 Single or Dual Loop Mixed Input Analyzer

Honeywell



Features

- **New!!!** Modbus/Ethernet option includes web server for monitoring analyzer from up to 10 different clients, e-mail support for alarm status updates, and DHCP configuration for dynamic Ethernet IP addressing
- Single or dual inputs — Dual input model accepts any combination of pH, ORP, conductivity, and dissolved oxygen
- Versatile, backlit graphical display
- Isolated inputs and outputs — Up to three analog outputs and four relays for monitoring and control
- Infrared port for PC and Pocket PC configuration, RS485 serial for Modbus RTU, and Ethernet for Modbus TCP
- Full DIN size — Fits panel cutouts of 7082 and 9782 analyzers
- CSA Type 4X (NEMA 4) enclosure with panel, wall, or pipe mounting — Easy access through hinged front door

The UDA2182 analyzer can accept single or dual inputs from Honeywell pH, ORP, contacting conductivity and dissolved oxygen sensors.

The graphical backlit LED can display two PV values and their engineering units simultaneously. Looking at the display, you'll also see the process temperature of both PVs, the analog output full scale percent, and the state of the relays. The display can show tags for each input, time/date information, and status messages.

Like the Honeywell UDC controllers, you can configure the UDA2182 with a PC or with a Pocket PC, using the embedded infrared communication port. There's absolutely no need to get access to the back of the unit to download or upload a brand new configuration!

With the UDA's mix-and-match design, analytical measurements of pH, conductivity and dissolved oxygen (ppm or ppb) can all be done in one analyzer. By upgrading, you'll be able to reduce inventory and add flexibility to your systems. Input boards are easy to replace. And you can add relays or an analog output with a single board. Board changes are fast and easy with front-hinged access to the analyzer.

The UDA2182 controller can be configured for On-Off, Current Adjusting Type (CAT), Pulse Frequency Type (PFT), Duration Adjusting Type (DAT), and PID. Each control loop has Honeywell's performance proven AccuTune III tuning algorithm. A selectable "Fuzzy Logic" algorithm is also provided for each loop to suppress unwanted process setpoint overshoot.

Two or four alarm relays are field-selectable for activating external equipment at alarm setpoints. Each alarm setpoint can be either a high or low alarm. Relays can also be assigned to temperature or diagnostics. They can also be configured to alarm on conductivity values.

Added Features

Realtime Clock: The realtime clock supports time/date stamps for events and calibrations. Date/time stamps can be selected as tag names so they appear at the top of the display.

Auto Clean/Cal: Using the realtime clock, the UDA2182 can be configured to run a periodic cycle to clean and calibrate sensors.

Event/Calibration Histories: The UDA stores up to 256 time/date stamped events and up to 128 calibration events. Event (excluding calibration) data can be uploaded to a PC for reporting.

pH Measurement from Differential Conductivity: If you're measuring specific and cation conductivity, the UDA can calculate the pH level of your high purity water.

CO2 Measurement: UDA can calculate the concentration of CO2 (ppm) through cation and de-gassed conductivity levels.

USP26 Conformance for High Purity Water: The UDA2182 meets USP26 standards for alarming on increased conductivity.

Protection: CSA Type 4X (NEMA 4X) rating for front and case permits use in applications where it may be subjected to moisture, dust, or hose-down conditions.

Approval: General Purpose CSA certification and UL listing and FM Class I, Div. 2 is standard.

Data Security: Keyboard security protects configuration and calibration data, accessed by a configurable 4-digit code. Nonvolatile EEPROM memory assures data integrity during loss of power.

Diagnostic/Failsafe Outputs: Continuous diagnostic routines detect failure modes, trigger a failsafe output value and identify the failure to minimize troubleshooting time.

High Noise Immunity: Provides reliable, error-free performance in industrial environments that affect noise-sensitive digital equipment.

pH Auto Buffer Calibration: The unit can be set up to recognize NIST, US, and Euro buffers and automatically select the standardize and slope values at the calibration temperature

Solution Temperature Compensation (high-purity water): You can select preset compensations or configure custom values.

Computed Variables: For two-cell conductivity measurements, computed values of %Rejection/Passage, Difference, or Ratio can be displayed and assigned to the outputs or alarms.

Dissolved Oxygen: Auto-ranging of display and outputs with relays to indicate range, specialized probe bias diagnostics.

Search www.lesman.com for
Honeywell UDA2182
Go

Specifications

Ranges: *pH:* 0-14 pH; *ORP:* -1600 to 1600 mV; *Conductivity:* 0.01 Cell: 0-2 uS/cm; 0.1 Cell: 0-20 uS/cm or 0-2 mS/cm, 0-20 megohm-cm, 0-2,000 ppm TDS, 0-2,000 ppb TDS; 1.0 Cell: 0-200 uS/cm or 0-20 mS/cm; 10 Cell: 0-2,000 uS/cm or 0-200 mS/cm, 0-200ppt TDS; 50 Cell: 0-20,000 uS/cm or 0-1,000 mS/cm, 0-20% Concentration; *Temperature:* 14° to 284°F (-10° to 140°C); *Dissolved Oxygen:* 0–200 ppm; 0–20 ppb; 0–200 ppb; 0–2000ppb; Temperature: 35.6°–104°F (2°–60°C), must not freeze

Accuracy: 0.5% reading; *Output:* ±0.01 mA; *Repeatability:* 0.05%

Temperature Accuracy: *pH and Conductivity Thermistor:* ±0.1°C from -10° to 100° C, ±1.0° C from 101° to 140° C; *pH 1000Ω RTD:* ±0.4° C; *Dissolved Oxygen Thermistor:* ±0.1° C from 2° to 60° C

pH Temperature Compensation: Conventional compensation for changing electrode output (Nernst response), plus selectable solution temperature compensation for high-purity water.

pH Auto Buffer Recognition: NIST, US, Euro buffers, user-selectable

Conductivity Compensations: NaCl, HCl, H_2SO_4, PO_4, NaOH, NH_3, Morpholine, Pure Water, Custom (User Selectable)

Dissolved Oxygen: *Max flow rate (probe):* 950 ml/min with flow chamber; no dependence on stirring or flow rate; *Atmospheric pressure:* 500-800 mm Hg with internal sensor; Calibration with either air or sample

Operating Conditions: *Ambient Temperature:* 32° to 140°F; RH: 5 to 90% max. Non-condensing up to 104°F. *Vibration:* 5-15 Hz disp 8 mm pk to pk 15-200 Hz accel 2 G

Analog Output: *Standard:* Two 0/4-20 mA DC, 750Ω max., isolated from inputs, ground, and each other, independently field-assignable to any parameters and ranges. *Optional:* One 0/4-20 mA DC, 750Ω max., isolated from inputs, ground, and each other.

Alarm/ Control Relays: (2 Standard, 2 Optional) SPDT (Form C) Relays; Resistive Load: 4A, 120/240 VAC

Wireless Interface: Infrared (IrDA); 0–1 meter link length, 0°–15° offset, 9600 baud, Modbus protocol

Power Requirements: 90–264 VAC, 47-63 Hz, 15 VA.

Keypad: 10-button membrane switch, UV/Solvent/Abrasion resistant

Alarm/Control Settings: *Alarm/on-off control delay:* 0–100 sec.; *Deadbands:* Individually set from 1 count to full scale for pH, ORP, and temp.; *On/off cycle period:* 0–1000 sec.; *On/off Percent ON time:* 0–100%, 1% resolution; *Setpoint/proportional band limits:* ±19.99 pH, ±1999 mV, -10° to 130°C, 1 count resolution; *DAT cycle:* 1–1999 sec.; *PFT frequency:* 1–200 pulse/minute max.; *PFT pulse width:* 50ms, for electronic pulse-type metering pumps.

Control Loop/Outputs (Optional): Control Loops: 2 standard (one for each PV); current, pulse frequency, or time proportional Control Loop Types: PID, Duplex, On/Off Auto-tuning: AccuTune II, fuzzy logic overshoot suppression, applicable to both control loops

Communications Interface (Optional): *RS422/RS485 Modbus RTU slave:* Two-wire multidrop, 31 drops max, selectable baud rates to 115200; *Ethernet TCP/IP:* 10/100-BaseT, 330 ft max length over CAT5 cable; Configured via front panel or web; *Modbus TCP/IP:* For monitoring output, status, alarms, and variables; Web server with multiple client support; E-mail alarm notification to up to eight addresses

Display: Graphical LCD (128x64 pixels) with white LED Backlight

Case: GE Valox® 357; CSA Type 4X/NEMA 4X

Approval: CE compliant, UL/CSA general purpose, FM approval Class I, Div 2

Dimensions: *Case:* 6.14" X 6.14" X 5.91"; *Panel cutout:* 5.45" square; *Panel thickness:* 0.06" min, 0.38" max

One Analyzer to Measure Them All!

pH/ORP

- **Inputs**
  - Durafet III ISFET electrodes
  - Meredian I and II electrodes (pH and ORP)
  - HPW7000 high purity water systems
- **pH-Specific Features**
  - Calibration options: Manual, automatic buffer recognition, and sample cal
  - Diagnostics: Zero offset, and percent theoretical slope (PTS)
  - High purity water solution temperature compensation

Conductivity

- **Inputs**
  - Contacting conductivity only (no toroidal sensors)
- **Conductivity-Specific Features**
  - USP26 alarm capability
  - Solution temperature compensation
  - Percent rejection/passage
  - Difference and ratio

Dissolved Oxygen

- **Input**
  - DL5000 dissolved oxygen probes
- **DO-Specific Features**
  - Automatic altitude (pressure) compensation
  - 60-minute power backup
  - Automatic salinity compensations
  - Display of probe bias curves

See page 47 for more on Process Instrument Explorer configuration software

Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: UDA2182-_ _ _ - _ _ _ - _ _ - _ - _ E _ _.

Model Selection Guide

Description		Catalog Number	Price
Two 4-20 mA outputs, two alarm relays, panel mount hardware, and IrDA port			
UDA2182 Analytical Analyzer		UDA2182-	$690.00
Channel 1 Input	pH/ORP	PH1-	210.00
	pH from Preamp	PA1-	270.00
	Conductivity	CC1-	270.00
	Dissolved Oxygen ppm	DM1-	210.00
	Dissolved Oxygen ppb	DB1-	1790.00
Channel 2 Input	None	NN2-	0.00
	pH/ORP	PH2-	210.00
	pH from Preamp	PA2-	270.00
	Conductivity	CC2-	270.00
	Dissolved Oxygen ppm	DM2-	210.00
	Dissolved Oxygen ppb	DB2-	1790.00
Outputs and Relays	None	NN-	0.00
	+(1) 0/4-20 mA Output + 2 Relays	C3-	210.00
Communications	None	N-	0.00
	Serial Input: Ethernet/Modbus	E-	200.00
Mounting Hardware	None (Panel Mount Only)	0 _ _ _	0.00
	Pipe and Wall Mount	P _ _ _	50.00
Manual	Printed Instruction Manual	_ E _ _	10.00
Certificates	None	_ _ 0 _	0.00
	Calibration and Conformance	_ _ C _	50.00
PID Control	None	_ _ _ 0	0.00
	Yes (See Note)	_ _ _ C	200.00
Accessories			
Process Instrument Explorer Software		50001619-001	150.00
Actisys Serial to Infrared Adapter for PCs		ACT-IR220L+	95.00
Bezel Assembly		51453518-502	270.50
Input Card: pH/ORP Measurement		51453313-501	210.00
Input Card: pH from Preamp		50009551-501	270.00
Input Card: Contacting Conductivity		51453316-501	270.00

Note: *Includes Auto Clean/Cal, USP26 Pure Water Functionality and pH Level/CO2 Concentration from Differential Conductivity.*

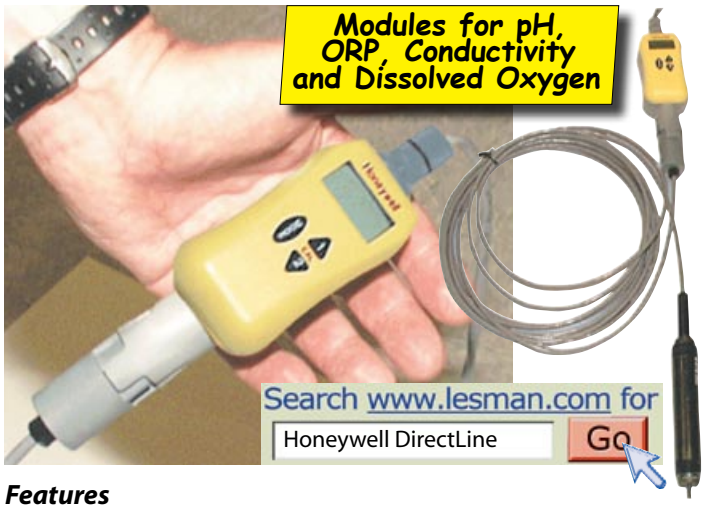
Don't see the input card you need? Call 800-953-7626.

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

DirectLine™ Two-Wire Transmitter with Flexible Mounting



Features

- One third the cost of traditional analyzer/cable/sensor configurations!!!
- Local display and keypad for easy setup, calibration, and use
- Built-in diagnostics reduce troubleshooting time
- Plug-in modular design lets you safely remove and replace the probe without cycling power on the module
- Sampling and auto buffer options reduce calibration time
- Direct 4-20 mA output eliminates need for dedicated analyzers or transmitters, simplifying installation, start-up, operation, and maintenance tasks
- Integral electronics with local user interface simplifies installation and shortens calibration times
- Modular plug-in design simplifies electrode replacement
- Playing card-sized guide helps ensure simple, correct, and consistent calibration and configuration

Flexibility Saves Installation Time and Costs

Honeywell's DirectLine architecture includes an electronics module integral to the electrode, eliminating the additional time and cost of installing an analyzer or transmitter, a separate preamp, and special cable! The electronics module provides a direct 4-20 mA output proportional to pH, ORP, DO, or conductivity.

The electronics module provides display, configuration, and calibration capabilities in a weatherproof and corrosion-resistant enclosure. You can order the sensors with a universal mounting kit, so the modules can be mounted on a wall, surface, or a pipe, or clipped to a DIN rail.

The DirectLine module continuously performs self-diagnostics on both the electronics and sensor. If a problem arises with the electronics or the sensor, the software prioritizes the problem type and displays only the highest priority error diagnostic. Once the problem is corrected, the error code disappears from the display.

Calibration Was Never So Quick and Easy

Location, location, location! The DirectLine eliminates the extra time required to travel back and forth between the analyzer/transmitter and the sensor while you're performing a calibration. If applicable, take advantage of the auto buffer recognition calibration option to further reduce the time and cost of your calibrations. Forgot how to calibrate the pH/ORP electrode? The other side of the configuration guide quickly steps you through an electrode calibration.

Measuring Conductivity

- EEPROM memory provides all cell info (cell constant and calibration factor), saves setup time and reduces errors
- Trim value or one-point solution calibration options reduce calibration time
- DL423 module can be used for conductivity, resistivity, TDS, and concentration
- Polyethersulfone cell bodies provide excellent corrosion resistance. Cell constants for processes from ultrapure water to acid/base concentrations

Measuring Dissolved Oxygen

- Better accuracy with equilibrium probe — sensor readings independent of fouling and flow
- No internal probe maintenance — no electrolytes or electrodes to replace!
- No recalibrating after cleaning probes!
- No membrane replacement!

Condensed Specifications

Engineering Units: pH; mV; °F; °C

Displayed Accuracy: *pH:* ±0.02; *ORP:* ±1 mV; *DO:* ±0.2ppm after stabilization, greater of ±2ppb or 5% reading after stabilization; *Conductivity/Resistivity:* Greater of ±2 counts or ±0.5% reading; *Concentration:* ±0.5% reading; *Temperature:* ±0.1°C from -10° to 99.9°C, ±1°C from 100° to 140°C

Displayed Process Variable: *pH:* 0-14; *ORP:* –1600 to 1600 mV; *Conductivity:* 0-2000 µS/cm, 0-20.00 mS/cm, 0-1000 mS/cm; *Resistivity:* 0-20.00 MΩ/cm; *TDS:* 0-2000 ppm/ppb, 0-200 ppt; *%Concentration:* 0-20.00% *DO:* 0-20 ppm in 1 ppm increments or 0-200 ppb in 1 and 10 ppb increments

Displayed Temperature Range: *pH:* 14° to 230° F; *DO:* 35.6° to 140°F; *Conductivity:* 14° to 284°F

Sensor Survivable Temperature Range: 14° to 266° F

Electronics Module Ambient Temperature: -4° to 185° F

Temperature Compensation: 0.00pH/10° C; -0.16pH/10° C; 0.32 pH/10° C

Output: 4-20 mA, 2-wire loop powered; *Calibration:* 4-20 mA

Sensor Mating Connector Rating: Submersible to 20 feet

Output Cable: Shielded twisted pair; *Termination:* Tinned leads; *Output:* 20' or 50'; *Sensor:* Durafet: 20' or 50'; Meredian: 12' or 20'

Power: 16-42 VDC; *Max Load:* 250Ω @ 16 VDC; 600Ω @ 24 VDC; 1400Ω @ 42 VDC

Local Display and Buttons: 4-digit, 7-segment LCD

Calibration Options: 1-point or 2-point sample; *Auto Buffer Recognition:* Selections: US, NIST, EURO

Case: Weatherproof, corrosion-resistant plastic housing

Diagnostics: Sensor and electronics

Remote Mounting: Pipe, wall, or DIN rail

Approvals: CE Mark for Industrial Applications; UL and CSA General Purpose; FM Class I, Div. 1, Groups C-D and Class I, Zone 0, A Ex ia IIB (I.S.); FM Class I, Div. 2, Groups C-D; Class I, Zone 2, Groups IIB (non-incendive field wiring)

Honeywell

Learn more about DirectLine at Lesman.com

Ordering Instructions

Make a selection from each table. Follow the arrows down to be sure the unit you want is available. Complete catalog numbers look like this:

Module: DL4_ _ - _ - _ - _ - _ _ _ _
Electrode Mounting: DL1 _ _ _ - _ _ _ _

Step 1. Select your electronics
Step 2. Select the probe and mounting
Step 3. Place your order with Lesman!

Electronics modules, probes, and mountings must be specified as separate line items.

Improved Enclosure

- 1/2" NPT conduit connection provides increased protection and noise immunity for output cable. Available on all DirectLine sensor modules.
- IP68 watertight output cable connection
- Protective PC sleeve on probe/module connections
- Captive stainless steel screw, thicker wall

Step 1: Select Your Electronics Module

Description	Catalog Number	Avail-ability			Price
DirectLine Sensor Electronics Module					
For Use with Durafet III, Meredian II, and HPW7000 pH Electrodes	DL421	↓			$475.00
For Use with Contacting Conductivity Cells	DL423		↓		525.00
For Use with Dissolved Oxygen ppm Probes	DL424			↓	635.00
Output Cable for Integral or Remote Mounting					
Cordset: 19.7 Ft (6m) w/ Connector, Cable	E	•	•	•	45.00
Field Wiring Connector Only	F	•	•	•	20.00
Sensor Cable for Remote Mounting					
No Cable Required, Integral Mount	0	•	•	•	0.00
No Cable: Conductivity Remote Mount	5		e		130.00
No Cable: Dissolved Oxygen Remote Mount	6			e	130.00
Output Cable: Durafet III Remote, 20 Feet	7	f			200.00
Output Cable: Durafet III Remote, 50 Feet	8	f			255.00
Remote Mounting Options					
None	A	•	•	•	0.00
2" Pipe Mount Bracket, Wall Mount, DIN-Rail Clip	B	•	•	•	55.00
Options					
No ID Tag, No Certificates	0000	•	•	•	0.00

Restrictions

e For remote mount models only.
f For remote mount models only. Requires Durafet III electrode with Vario Pin connector.

DirectLine models also available for ORP and PPB dissolved oxygen. Call for pricing.

Accessories and Replacement Parts

Description	Catalog Number	Price
DirectLine Replacement Sensor Module for pH	51452682-001	$475.00
Field Wiring Cable — 20 Feet	51500270-001	170.00
Field Wiring Cable — 50 Feet	51500270-002	200.00

Call for pricing on 20 foot and 50 foot remote electrode mounting cables.

Not sure DirectLine is right for you? Fill out a Honeywell analytical instruments datasheet at www.Lesman.com/datasheets and fax it to Lesman for engineering review.

Step 2: DL421 with Durafet III Electrodes

Description		Catalog Number	Price
Electrode Mounting for Durafet III pH Electrode		**DL1-**	**$0.00**
Insertion/ Removal (7774)	CPVC Ball Valve Assembly	741	915.00
	316SS Ball Valve Assembly	742	1435.00
Inline (7777) for 3/4" Pipe Tee	1" Electrode, Remote DL421 Mount	771	290.00
	1" Electrode, Integral DL421 Mount	772	290.00
	1" Electrode, Remote, Vario Pin Mount	774	355.00
Immersion (7777)	1" Electrode, Remote DL421 Mount	773	290.00
	1" Electrode, Remote DL421 Vario Pin	775	355.00
Options	No ID Tag, No Certificates	0000	0.00

Need a sanitary mount pH electrode? Call Lesman for pricing and availability.

Step 2: DL423 for Contacting Conductivity

Description		Catalog Number	Price
Electrode Mount for Contacting Conductivity Probes		**DL4-**	**$0.00**
Remote Mount 3/4" NPT Compression Fittings			
Cell Constant 0.1	Graphite Construction	SX1	110.00
Cell Constant 1.0	Graphite Construction	SX2	110.00
Cell Constant 10.0	Platinum Construction	SX3	125.00
Factory Use and Special Construction Codes		000-0000	0.00

Note: Remote cells are supplied with an integral 20-foot sensor cable that must be wired to the DL423 remote connector.

Step 2: DL424/425 for Dissolved Oxygen

Description		Catalog Number	Price
DL5000 Dissolved Oxygen Probe - Parts per Billion		**DL5PPB**	**0.00**
DL5000 Dissolved Oxygen Probe - Parts per Million		**DL5PPM**	**0.00**
Probe Material/ Mount (See Note)	PVC Probe, Integral Mount, No Cable	100	840.00
	PVC Probe, Remote Mount, 20 Ft Cable	300	840.00
	PVC Probe, Remote Mount, 100 Ft Cable	700	925.00
	316 SS Probe, Integral Mount, No Cable	200	1125.00
	316 SS Probe, Remote Mount, 20 Ft Cable	400	1125.00
Tagging	None	00_ _	0.00
	Stainless Steel ID Tag (3 Lines, 22 Char/Line)	SS_ _	35.00
Warranty	Standard Warranty	_ _00	0.00
	1 Year Extended Warranty	_ _W2	140.00
	2 Years Extended Warranty	_ _W3	225.00

Note: Remote mounted 316SS probe available ONLY on DL5PPB models.

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

Analytical Process Transmitters

Features

- Large display with easy-to-read 3/4" measured value
- Simple operator interface with basic pictographs
- Continuous diagnostics for monitoring calibration, cell health, and transmitter self-test
- Manual loopback check for integrity of 4-20 mA output
- Wall, pipe, or panel mount NEMA 4X/IP65 plastic enclosure
- Quick response time (less than five seconds per step change)

Features Unique to APT2000

- HART® bidirectional communications protocol
- Application in hazardous and safe areas
- Optical alarm signaling by blinking red LED
- Integrated current source for checking peripheral devices

Features Unique to APT4000

- Applications in Class I, Div 2 or General Purpose areas
- USP24 software with UPS control limit capabilities
- Remote "Hold Last Measured Value" capability
- Second parameter set programmable
- Optical alarm with relay contact
- Two current outputs available. Output 2 for temperature
- PID (pulse length and pulse frequency) software installed

Need more sophisticated analysis and control? Looking for one device to handle pH, ORP, Conductivity, and Dissolved Oxygen? See the UDA2182 on page 142.

Condensed Specifications

pH/mV Input

Range: *pH value:* 0.00 to 14.00 pH; *ORP value:* -1500 to +1500 mV

Accuracy: *pH:* <0.02; *Tc:* 0.0021 *pH/K mV:* <1 mV *Tc:* 0.1 mV/K

Conductivity Input (Contacting)

Range: *Contacting:* 0000 to 9999 (0, 1, 2, or 3 decimal) µS/cm; 0000 to 9999 (1, 2, or 3 decimal) mS/cm; 0000 to 9999 (1, 2, or 3 decimal) MΩ-cm; *Toroidal:* 00.00 to 99.99, 000.0 to 999.9, or 0000 to 1999 mS/cm

Accuracy: *Contacting:* Greater of <1% measured value or ±0.4 µS/cm * cell constant; *Toroidal:* 1% measured value ± 0.02 mS/cm ± 1 LDS

Diagnostics

Sensocheck: Polarization detection and monitoring of cable capacitance

Sensor Standardization: Entry of cell calibration factor with display of conductivity and temperature; Temperature probe adjustment

Sensoface: Monitors asymmetry potential, slope, calibration response time

Temperature Input

Range: *8550 Ω Thermistor:* -14° to 266°F; *Pt100/1000 Ω RTD:* 4° to 302°F

Accuracy: < 0.5 K; **Resolution:** 0.1 °C or 1 °F

Temperature Compensation: Automatic or manual adjust

Supply/Output

Current Source: 3.80 mA to 22.0 mA; *Overrange:* 22 mA for error messages; *Error:* <0.3 % of current value + 0.05 mA

Specifications Unique to APT2000

Area Certifications / Compliances

General Purpose: Zone 2 (USA) *FM:* NI, Class I, Div 2, Groups A – D, T4

Intrinsically Safe: Zone 1 (USA) *FM:* IS, Class I, Div 1, Groups A – D, T4 Zone 1 (Europe); *CENELEC:* II 2G EEx ib [ia] IIC T6

APT2000TC: FM Class 1, Div. 2, Groups A-D

Need a HART® handheld communicator? See page 361.

Specifications Unique to APT4000

PID Function: Relay assignable for PID Control, (pulse length/frequency)

Alarm Relay Contacts: *Min/max:* SPST N/O (Hysteresis 0.2% range); *Diagnostic:* SPST N/C; *Wash:* SPST N/O

Supply Voltage: 20 to 253 VAC/DC, 45 Hz to 65 Hz, 2 VA/1.5 W

USP24 Software: Software for on-line water conductivity monitoring

Supply Output Current: 0 or 4 to 20 mA current loop, 10 V floating; Output #1 for PV, Output #2 for Temperature

Output Minimum Span: *Linear:* 5% selected range. *Logarithmic:* 1 decade

Max Current/Voltage: *AC:* <250V/<3A/<750 VA *DC:* < 30 V/ < 3A / < 90 W

Approvals: *Area Certification:* Zone 2 (USA) *FM:* NI, Class I, Division 2, Groups A-D, T4; *APT4000TC:* FM Class 1, Div. 2, Groups A-D

Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: APT2000_ _-H - _ _ - E00 or APT4000_ _-E00

Model Selection Guide

Description		Catalog Number	Availability			Price Each
APT2000 Two-Wire Analytical Process Transmitter, HART® Communication						
Model	pH/ORP	APT2000PH-H-	↓			$1260.00
	Conductivity	APT2000CC-H-	↓			1260.00
	Toroidal Conductivity	APT2000TC-H-		↓		1280.00
Approval	General Purpose: FM/CSA Class I, Div. 2, Grps. A-D	00-	•	•		0.00
	Intrinsically Safe: FM/CSA Class I, Div. I, Grps. A-D, CENELEC	IS-	•			130.00
English User's Manual		E00	•	•	•	0.00
APT4000 Four-Wire Analyzer/Transmitter/Controller						
Model	pH/ORP	APT4000PH-			↓	1215.00
	Conductivity	APT4000CC-			↓	1215.00
	Toroidal Conductivity	APT4000TC-			↓	1215.00
English User's Manual		E00	•	•	•	0.00

Honeywell Replacement Electrodes for pH and ORP Use

Measure	Electrode Type	Connection/Leads	Temperature Range	Catalog Number	Fits Enclosure 77__ 58	73	74	77	Price
pH	Durafet II	3/4", 1-1/4" or 1-1/2" NPT, Quick Disconnect	-10° to 110°C	51204976-501	x	x	x		$295.00
pH	Durafet II	3/4" NPT, Quick Disconnect	-10° to 110°C	51204976-502	x	x			265.00
pH	Durafet II	1-1/4" or 1-1/2" NPT, 12 Ft. Integral	-10° to 110°C	51204976-503			x		400.00
pH	Durafet II	1-1/4" or 1-1/2" NPT, 20 Ft. Integral	-10° to 110°C	51204976-504			x		420.00
pH	Durafet II	3/4" NPT, Quick Disconnect	-10° to 110°C	L 51205554-501				x	295.00
pH	Durafet II	3/4", 1-1/4" or 1-1/2" NPT, Quick Disconnect	-10° to 110°C	L 51205554-502			x	x	295.00
pH	Durafet II	3/4" NPT, 12 Ft. Integral	-10° to 110°C	51205554-503				x	400.00
pH	Durafet II	3/4" NPT, 20 Ft. Integral	-10° to 110°C	51205554-504				x	420.00
pH	Durafet II	3/4" NPT, 50 Ft. Integral	-10° to 110°C	51205554-505				x	520.00
pH	Durafet II	3/4" NPT, 50 Ft. Integral	-10° to 110°C	51205554-512			x	x	280.00
pH	Glass Measuring	3/4" NPT, Screw Cap	10° to 80°C	31117390-501	x	x			150.00
pH	Glass Measuring (Antimony)	3/4" NPT	5° to 75°C	31117399-501	x	x			390.00
pH	Glass Combination + ATC	1.25" or 1.5" NPT, 12 Ft. Tinned, Coax, Conductors	10° to 80°C	L 31050381-501	x		x		305.00
pH	Glass Combination	3/4" NPT, Screw Cap w/ 6" Spade Lug	10° to 100°C	L 31117486-501	x	x			245.00
pH	Glass Combination	1-1/4" or 1-1/2" NPT		31117495-501	x		x		270.00
pH	Glass Combination	3/4", 1-1/4" or 1-1/2" NPT, 12 Ft. Tinned	0° to 80°C	31117489-501		x	x		245.00
pH	Glass Combination	3/4", 1-1/4" or 1-1/2" NPT, 12 Ft. Quick Disconnect	0° to 80°C	31074387-501			x	x	310.00
pH	Glass Combination	3/4" NPT, 16" Quick Disconnect	0° to 80°C	31074397-501				x	310.00
pH	Glass Combination	3/4" NPT, 12 Ft. Quick Disconnect	0° to 80°C	31074399-501				x	310.00
ORP	Glass Combination	3/4", 1-1/4" or 1-1/2" NPT, 12 Ft. Tinned	-5° to 130°C	31020751-501	x	x	x		250.00
ORP	Glass Combination	3/4", 1-1/4" or 1-1/2" NPT, 12 Ft. Tinned	-5° to 100°C	51451341-503			x	x	475.00
ORP	Glass Combination	3/4", 1-1/4" or 1-1/2" NPT, 12 Ft. Tinned	-5° to 110°C	51451340-503			x	x	455.00
Reference	Single Junction	Gel Filled, Ryton Body, 3/4" NPT		31117481-501		x			150.00
Automatic Temperature Compensation		3/4" NPT		31022289-501		x			130.00
Automatic Temperature Compensation		3/4" NPT		31152137-501		x			155.00
Cap Adapter for Durafet II Electrodes		20 Ft. Cable		51205965-502	x	x	x	x	275.00

Durafet II to Durafet III Cross Reference

Use the cross reference table to change existing Durafet II Installations to a Durafet III Installation. Both electrode and cable have to be changed.

Notes:

1 Use 20 foot Durafet III cables for these shorter lengths.

2 Use 50 foot Durafet III cables for these shorter lengths.

Description			Durafet II	Durafet III	Price
Industrial Electrode	In-Line w/o Tip Guard, 8550 Thermistor		51205554-001	51453503-501	$360.00
	In-Line w/o Tip Guard, 1000 ohm RTD		51205554-009	51453503-502	360.00
	Immersion w/Tip Guard, 8550 Thermistor		51205554-002	51453503-505	360.00
	Immersion w/Tip Guard, 1000 ohm RTD		51205554-010	51453503-506	360.00
Sanitary Durafet	1.5" flange, shallow insertion		51450948-001	51453535-501	525.00
	1.5" flange, deep insertion		51450948-002	51453535-502	525.00
	2" flange, shallow insertion		51450948-003	51453535-503	525.00
	2" flange, deep insertion		51450948-004	51453535-504	525.00
	3" flange, shallow insertion		51450948-005	51453535-505	525.00
	3" flange, deep insertion		51450948-006	51453535-506	525.00
Preamp Cable	4 foot Length	(Note 1)	51204782-006	50001623-501	210.00
	8 foot Length	(Note 1)	51204782-007	50001623-501	210.00
	12 foot Length	(Note 1)	51204782-001	50001623-501	210.00
	20 foot Length		51204782-002	50001623-501	210.00
	30 foot Length	(Note 2)	51204782-003	50001623-502	297.00
	40 foot Length	(Note 2)	51204782-004	50001623-502	297.00
	50 foot Length		51204782-005	50001623-502	297.00
Cap Adapter Cable	4 foot Length	(Note 1)	51205965-006	51453388-501	345.00
	8 foot Length	(Note 1)	51205965-007	51453388-501	345.00
	12 foot Length	(Note 1)	51205965-001	51453388-501	345.00
	20 foot Length		51205965-002	51453388-501	345.00
	50 foot Length		51205965-005	51453388-502	405.00
DirectLine Remote Cable	20 foot Length		51500270-001	51453225-001	200.00
	50 foot Length		51500270-002	51453225-002	255.00

Accessories			
	pH Buffer Solution 4.01	31103001-501	$28.50
	pH Buffer Solution 6.86	31103002-501	28.50
	pH Buffer Solution 9.18	31103003-501	28.50

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Fax: 630-595-2386

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www.lesman.com
sales@lesman.com

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Fax: 262-923-1797

HB Series Rugged pH/ORP Electrodes

Features

- One electrode for entire pH and temperature ranges. Can be used in both low and high pH conditions
- Great for high temperature and high pressure applications
- Chemically resistant CPVC, Kynar or Polypropylene body
- Integral automatic temperature compensator
- Compatible with most industrial transmitters and analyzers; Retrofittable to existing pH instrumentation

Axial Ion Path Technology

- Eliminates glass breakage and leak pathways during manufacture — no more DOA sensors
- Complete filling of reference body allows extreme temperature and pressure tolerance
- Non-polymerized electrolyte ensures chemical compatibility
- Large-area, liquid junction slows the buildup of coatings and reduces sensor drift

HB546 Electrode (Left)

- Suitable for threaded in-line and submersion applications; may be mounted in any position
- Designed with a 3/4" NPTM threaded nose for installation into process, sample line, or automatic cleaning system
- Rugged, quick-change, quick-clean

- ***HB547 Electrode (Center)***
- For use with ball valve assemblies
- Available with 1" NPTM wrench-tite or 1.25" NPTM hand-tite compression fittings
- Insertion-retraction device

- ***HB551 Electrode (Right)***
- Great for sample lines and valve side-streams
- For quick-change in-line applications
- Designed with a 1" NPTM threaded adapter and an external nut-loc retainer to improve safety, and speed up removal and replacement

The HB Series of electrodes join Honeywell's industry-proven Meredian glass pH electrodes and Durafet ISFET (glass-free) pH electrodes to offer a complete solution for all pH needs.

Axial Ion Path Reference Cell Technology Explained

Axial Ion Path (AIP) technology prevents sensor poisoning, internal leaks, and internal plugging, allows extreme temperature and pressure tolerance, and allows for long life in low and high pH applications.

Like other rugged semi-solid state references, the reference is formed by a series of wood segments impregnated with KCL. The difference with AIP technology is where others use an epoxy or impermeable barrier between each of the wood segments; the AIP uses a pair of formed discs.

When the two formed disc faces are positioned adjacent to one another they form an axial ion path (filled with electrolyte) between each of the segments.

The axial ion path provides a more complete transition of KCl ions between the wood segments forward

HB546 threaded in-line or submersion
New!
HB547 ball-valve insertion sensor for high pressure use
HB547 quick-change in-line and submersion

and creates a difficult and longer distance for poisons traveling back into the reference from the specimen fluid. This is a porous surface, which passes ions between the reference and measurement fluid.

The primary function is to allow very small amounts of KCl to leach from the reference and provide the millivolts necessary for pH measurement. It also maintains a barrier between the measurement fluid and the reference so that the measurement fluid does not rapidly poison or foul the reference.

Temperature Compensator

This is typically a component (RTD, Resistor, Thermistor) that produces a proportional resistance to the temperature of a measured solution. The resistance is understood by the pH Transmitter/Indicator so it can make adjustment to the measurement slope to match the effect of temperature on the sensor. With conventional glass measuring electrodes the T.C. is typically located near the measurement bulb to reduce the time necessary to recognize the solution temperature.

Specifications

Operating Range: 0-14 pH

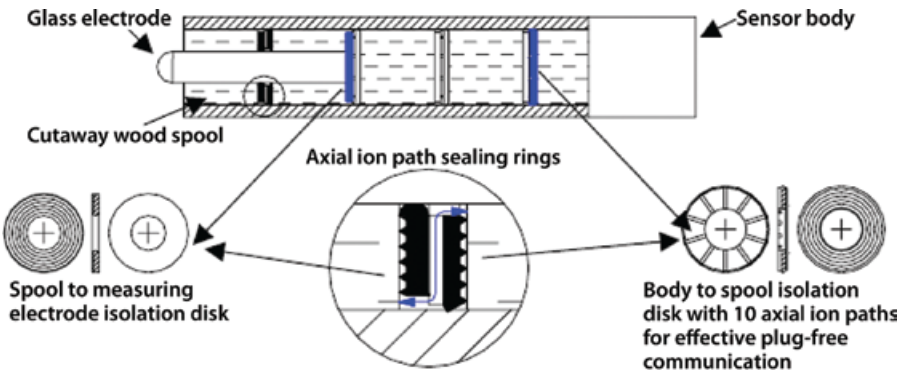
Pressure and Temperature Rating: *CPVC and Polypropylene:* 100 psig, 100°C; *Kynar:* 150 psig, 140°C; (High Pressure Insertion System: 300 psig)

HB546 Mounting: *Threaded in-line:* 3/4" NPTM threaded nose. *Submerged:* 3/4" NPTM threaded top connects to 3/4" NPTF coupling and extension pipe. *Ball-valve insertion:* High-pressure system, 1-1/4" or 1-1/2" full port valve

HB547 Mounting: *Ball-valve insertion:* 1" NPTM Wrench-tite, or 1-1/4" NPTM Hand-tite compression fitting. Requires 1-1/4" or larger full port ball valve.

HB551 Mounting: *Quick-change in-line:* 1" NPTM threaded adapter, nut-loc retainer. *Submerged:* 3/4" NPTM threaded top for connection to 3/4" NPTF coupling and extension pipe.

Construction: *Body:* Kynar, CPVC, Polypropylene; *Wetted Materials:* Gr.2 Titanium, 316 SS, porous Teflon, Viton, EPDM, Kalrez, Nickel, Wood and Glass


Glass electrode
Sensor body
Cutaway wood spool
Axial ion path sealing rings
Spool to measuring electrode isolation disk
Body to spool isolation disk with 10 axial ion paths for effective plug-free communication

Honeywell

Question:

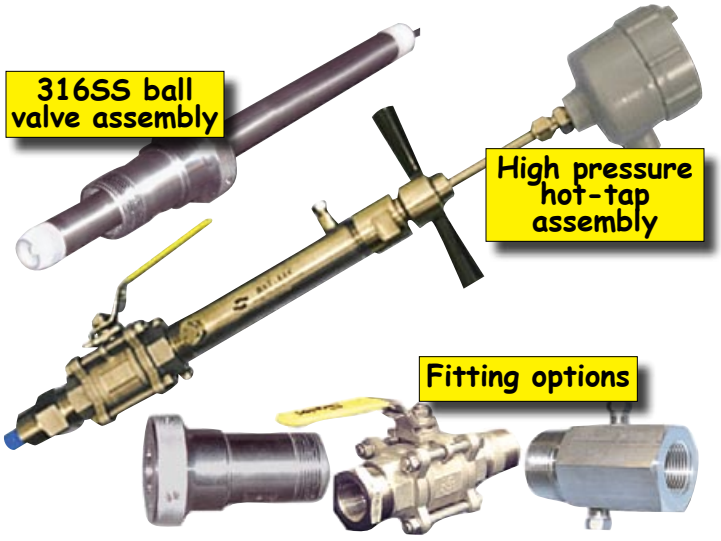
How does temperature affect pH measurement?

Answer:

Changes in fluid temperature have a direct effect on the measurement slope (from the original calibration). That is to say, an increase in temperature will raise the slope, and a decrease in temperature will lower it. With conventional glass electrodes, there is no temperature effect at exactly 7pH. But, the further the measurement differs from 7pH, the greater the effect.

If you expect changes in your process temperature, you should chose a temperature compensation sensor, which will adjust the measurement slope to correct for these variations.

Temperature will also directly affect the pH of all solutions, though the effect is impossible to predict as it varies by chemical composition.



Notes and Restrictions

d Available only with recessed or dual notch Teflon junction tips
e Available only with flush Teflon junction
f No temperature compensation sensor
g Available only with Hemi glass measuring electrode
h Requires lead termination option B2
2 Please use capillary option (temperature compensation option T) for process temperatures >85°C

Lead times less than two weeks for these models:

HB546-	HB547-	HB551-
PVSR-DKS0-15ST-000	BVSR-DKSN-30ST-000	PVSR-DKSN-05ST-000
PVSR-DKS0-15BT-000	BVSR-DKSN-30BT-000	PVSR-DKSN-05BT-000
PVSR-DKS0-15B2-000	BVSR-DKSN-30BZ-000	PVSR-DKSN-05B2-000
PVSR-DKS0-15PP-000	BVSR-DKSN-30PP-000	PVSR-DKSN-05PP-000
PVSR-DHS0-15ST-000		PVSR-DKSX-15ST-000
PVSR-DHS0-15BT-000		PVSR-DKSX-15BT-000
PVSR-DHS0-15B2-000		PVSR-DKSX-15B2-000
PVSR-DHS0-15PP-000		PVSR-DKSX-15PP-000

Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: HB5_ _-_ _ _ _-_ _ _ _-_ _ _ _-_ _ _ _-000

Description		Catalog Number	Availability ↓	Availability	Availability ↓	Price
In-Line or Submersible pH Sensor		HB546-				$0.00
pH Sensor for Ball Valve Insertion Assemblies		HB547-		↓		0.00
Quick-Change In-Line pH Sensor		HB551-			↓	0.00
Body Material	CPVC (100 PSIG Max)	C _ _ _-	•	•	•	225.00
	Polypropylene (100 PSIG Max)	P _ _ _-	•	•	•	240.00
	Kynar	B _ _ _-	•	•	•	385.00
O-Ring Material	Viton	_ VS _-	•	•	•	15.00
	EPDM	_ ES _-	•	•	•	15.00
Measuring Electrode	Hemi Glass	_ _ _ R-	d	d	d	85.00
	Flat Glass	_ _ _ F-	e	e	e	90.00
	Platinum ORP, Flat Solid Billet	_ _ _ X-	e	e	e	120.00
Sensor Tip Configuration	Flush Teflon Junction	T _ _ _-	•	•	•	30.00
	Recessed Teflon Junction	S _ _ _-	•	•	•	30.00
	Dual Notch Teflon Junction	D _ _ _-	•	•	•	80.00
Temperature Compensation Sensor	None (ORP Only)	_ N _ _-	f	f	f	0.00
	Honeywell 8550 Ohm	_ H _ _-	g	g	g	130.00
	Pt100 RTD Capillary	_ C _ _-	•	•	•	75.00
	Pt1000 RTD	_ K _ _-	2	2	2	55.00
	Pt1000 RTD Capillary (Hi Temp)	_ T _ _-	•	•	•	75.00
Insertion Depth	Standard Configuration	_ _ SN-	•	•	•	0.00
	0.5"	_ _ S0-	•			10.00
	1.5"	_ _ S1-	•			10.00
	100mm	_ _ SX-			•	60.00
Cable Configuration	6" Pigtail	TT _ _-	h	h	h	0.00
	Junction Box, 6" Pigtail	JJ _ _-	h	h	h	70.00
	5' Cable, Standard	05 _ _-	•	•	•	0.00
	15' Cable	15 _ _-	•	•	•	70.00
	30' Cable	30 _ _-	•	•	•	90.00
Lead Configuration	pH: Tinned; Temperature Compensation: Tinned	_ _ ST-	•	•	•	10.00
	pH: BNC; Temperature Compensation: Tinned	_ _ BT-	•	•	•	10.00
	pH: BNC; Temperature Compensation: 2-Pin Connector	_ _ B2-	•	•	•	10.00
	pH: Pin Lugs; Temperature Compensation: Pin Lugs	_ _ PP-	•	•	•	25.00
	pH: Tinned (ORP); Temperature Compensation: —	_ _ TN-	f	f	f	10.00
	pH: BNC (ORP); Temperature Compensation: —	_ _ BN-	f	f	f	10.00
	pH: Pinned (ORP); Temperature Compensation: —	_ _ PN-	f	f	f	10.00
Future Use		000	•	•	•	0.00
Extension Cable	10'	50027414-001	•	•	•	130.00
	20'	50027414-002	•	•	•	167.00
	50'	50027414-003	•	•	•	194.00
Hot Tap Assembly	316SS, Viton O-Rings, Ball Valve	50027419-001	f			1716.00
	316SS, Kalrez O-Rings, Ball Valve	50027419-002	f			1742.00
Wrench-Tite-Ball Valve	Assembly for Wrench-Tite Fitting	50027636-001		•		433.00
	316SS Wrench-Tite Fitting	50027406-001		•		238.00
	316SS Clean/Cal/Purge Fitting	50027412-003		•		250.00
Hand-Tite Ball Valve	Assembly for Hand-Tite Fitting	50027636-003		•		421.00
	316SS Hand-Tite Fitting	50027418-001		•		389.00
Sheath Sets	16" Titanium	50027425-001		•		216.00
	20" Titanium	50027425-002		•		249.00
	24" Titanium	50027425-003		•		292.00
Adapter Nut-Loc 1" NPT Male	CPVC Adapter	50027407-001			•	103.00
	Kynar Adapter	50027407-002			•	135.00
	316 Stainless Steel Adapter	50027407-003			•	125.00
	Kynar Adapter, 316SS Hex Nut	50027407-004			•	233.00
	316SS Adapter and Hex Nut	50027407-005			•	222.00
CPVC Ball Valve Assembly		50022247-501	•			828.00
Insertion Collar Stop (for 20" and 24" Sheath)		50027421-001		•		54.00

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

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pH Electrodes and Mountings

7777DVP Durafet III pH Electrode Mounting with Vario Pin Connector

- Durafet III ISFET technology for exceptionally fast response
- Virtually unbreakable, solid state design
- Vario Pin quick disconnect IP68 waterproof cable for easy electrode installation and replacement
- FM Approved intrinsically safe mounting for Class I, Div 1, Groups A-D areas with APT2000/DirectLine transmitters and barriers
- Rugged combination electrodes with fast-responding integral automatic temperature compensator

Honeywell's 7777 style electrode mounting enables users to interface Durafet® III pH electrodes to a process by either submersing the electrode or mounting it into a 3/4" threaded connection.

Durafet III electrodes provide fast, accurate, dependable pH measurement in the most demanding industrial applications.

Specifications

Operating Range: 0-14 pH; *Electrode:* 14° to 230°F (-10° to 110°C); *Cap Adapter Cable:* 32° to 158°F (0° to 70°C)

Mounting: Immersion or inline (3/4" NPT)

Materials: *Electrode body:* Ryton body, silicon ISFET die, ceramic reference junction, Viton media seal, nickel-plated brass, EPM reference frit seals; Cables: PVC, nickel-plated brass, and Viton

Pressure/Temperature Rating: Up to 100 PSIG at 122°F

Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: 07777DVP - _ _ - _ _ _ _

Model Selection Guide

Description		Catalog Number	Price
7777DVP Durafet® III ISFET Electrode and Mounting		07777DVP-	$0.00
Immersion (w/ Tip Guard)	With 8550Ω Thermistor	01-	355.00
	With 1000Ω RTD	02-	355.00
In-Line Mount (No Tip Guard)	With 8550Ω Thermistor	03-	355.00
	With 1000Ω RTD	04-	355.00
Cable Length	None	00-	0.00
	UDA2182, 20 Feet (6,10 Meters)	01-	215.00
	UDA2182, 50 Feet (15,24 Meters)	02-	290.00
	Cap Adapter, 20 Feet (6,10 Meters)	04-	345.00
	Cap Adapter, 50 Feet (15,24 Meters)	05-	405.00
Customer ID Tag	None	00 _ _	0.00
	Stainless Steel (3 Lines x 22 Char Each)	SS _ _	35.00
Certificates	None	_ _ 00	0.00
	Certificate of Calibration	_ _ CC	50.00
Accessories	Smooth Electrode Tip, In-Line Mount	51204993-501	8.40
	Guarded Tip, Immersion Mount	51204992-501	12.00
	CPVC Pipe Tee for In-Line Mounting	31120167-501	61.00

7794DVP Sanitary Durafet III pH Electrode

- Designed to meet rigorous 3A sanitary standards and authorized to use the 3A symbol for the food and dairy industries
- New "No Epoxy" packaging for greater reliability
- Remote mounting option for DirectLine® sensor
- Uses ISFET, solid-state sensor instead of conventional glass membrane
- Vario Pin quick disconnect IP68 waterproof cable for easy electrode installation and replacement
- Reference electrode and compensating temperature sensor integral with electrode

Honeywell's sanitary Durafet III features a virtually unbreakable electrode that permits direct insertion into production equipment without fear of contamination. Measurement can be online and continuous — no time-consuming grab sampling.

The Cap Adapter cable option acts as a preamplifier integral to the electrode cable. It doesn't require a separate mounting. The output can be connected directly to a Honeywell pH analyzer.

Specifications

Operating Range: 0-14 pH; 14° to 230°F (-10° to 110°C)

Sterilization Conditions: 130°C maximum at 50 PSIG

Maximum Process Pressure: 0 to 690 kPa from 14° to 212°F; 0 to 345 kPa at >212°F; 0 to 100 PSIG from 14° to 212°F; 0 to 50 PSIG at >212°F

Electrode Body: FDA-compliant Fortron® and polysulphone, ceramic reference junction, silicon ISFET measuring sensor, and a viton sensor seal

Mounting: Mounts to standard CIP fittings, Tri-Clamp or equivalent

Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: 07794DVP - _ _ - _ _ _ _

Model Selection Guide

Description		Catalog Number	Price
7794 Sanitary Mounting for Durafet III ISFET Electrodes		07794DVP-	$0.00
Immersion Style	1.5" Flange, Shallow Immersion (2.29")	01-	515.00
	1.5" Flange, Deep Immersion (2.91")	02-	515.00
	2" Flange, Shallow Immersion (2.83")	03-	515.00
	2" Flange, Deep Immersion (3.72")	04-	515.00
	3" Flange, Shallow Immersion (2.53")	05-	515.00
	3" Flange, Deep Immersion (3.72")	06-	515.00
Cable Length	None	00-	0.00
	UDA2182, 20 Feet (6,10 Meters)	01-	215.00
	UDA2182, 50 Feet (15,24 Meters)	02-	290.00
	Cap Adapter, 20 Feet (6,10 Meters)	04-	345.00
	Cap Adapter, 50 Feet (15,24 Meters)	05-	405.00
Customer ID Tag	None	00 _ _	0.00
	Stainless Steel (3 Lines x 22 Char Each)	SS _ _	35.00
Certificates	None	_ _ 00	0.00
	Certificate of Calibration	_ _ CC	50.00

Accessories			
	pH Buffer Solution 4.01	31103001-501	$28.50
	pH Buffer Solution 6.86	31103002-501	28.50
	pH Buffer Solution 9.18	31103003-501	28.50

Honeywell

Improved Durability and Reliability Increase pH Electrode Performance

Say Goodbye to Common Problems

- Grab samples
- Frequent replacement of broken pH sensors
- Slow response caused by aging sensors
- Frequent calibration
- Limited temperature and pH ranges

Honeywell Durafet® III pH electrode is a non-glass unbreakable ISFET-based pH sensor. This industry-proven electrode family, with years of application experience, provides fast, accurate, dependable pH measurement in the most demanding applications. The IP68-rated Vario Pin connector ensures a watertight cable connection to the electrode, enabling easy and reliable electrode replacement without twisting the cables.

Durafet III electrodes offer a reliable combination of measuring and reference electrodes, together with an integral automatic temperature compensator in a one-piece construction.

Improved Control for Increased Savings

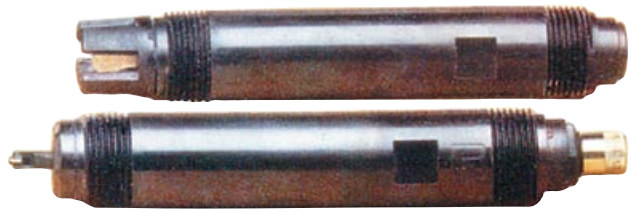
If you're using reagents like sodium hydroxide or sulfuric acid to control pH in your process, Honeywell can help you realize significant savings. The rapid response time and reduced hysteresis of Durafet III electrodes allow for real-time pH control, improving productivity and product quality while reducing costly chemical reagent consumption.

Superior Reliability in Submersion Applications

The Vario Pin, IP68-rated connector eliminates moisture or process intrusion when the electrode is submersed directly into a process. This cable option is available in 20-foot and 50-foot lengths. You gain improved reliability in high-moisture environments, reducing manhours spent troubleshooting, maintaining and calibrating moisture-related corrosion problems.

Electrode Mounting Compatibility

Style > / Mounting v	3/4" NPT Durafet III	3/4" NPT Durafet II	12mm Diam. Durafet II	3/4" NPT Integral DirectLine Durafet II
DirectLine Integral				●
DirectLine Remote	●	●		
7777D		●		
7777DVP	●			
7774D Stainless			●	
7774D CPVC		●		
7773D			●	
7758D			●	



7777 Durafet II and Meredian II Combination pH/ORP Electrodes

- Rugged electrodes with fast-responding integral automatic temperature compensator
- Easily mounted in any position — For inline and submersion use

Specifications

Mounting: Immersion or inline (3/4" NPT)

Materials: *Electrode body:* (Durafet) Ryton with Epoxy, (Meredian) Ryton; *O-rings:* EPM; *Counter electrode:* Hastelloy C

Pressure/Temperature Rating: Up to 100 PSIG at 122°F

Ordering Instructions

Make one selection from each section below. A finished catalog number looks like this 07777- _ - _ _ - _, _ _

Model Selection Guide

Description		Catalog Number	Price
7777 Mounting for Glass (Meredian) Electrodes		07777-	$0.00
For pH or ORP Direct-Connection Instruments, No Preamp For Remote-Mount Meredian II Glass Electrode Preamp Module, 20 Foot Quick-Disconnect Cable for Instrument		0- 3-	0.00 380.00
Immersion Mount pH	20 Ft. Tinned Leads, 32° to 176°F 12 Ft. Quick Disconnect, 68° to 230°F	16- 03-	345.00 310.00
Inline Mount pH	20 Ft. Tinned Leads, 32° to 176°F 12 Ft. Tinned Leads, 32° to 176°F	18- 14-	345.00 310.00
Immersion Mount ORP	12 Ft. Tinned Leads, 23° to 230°F 12 Ft. Tinned Leads, 23° to 230°F	07- 08-	475.00 455.00
Inline Mount ORP	20 Ft. Tinned Leads, 23° to 230°F 20 Ft. Tinned Leads, 23° to 230°F	27- 28-	475.00 455.00
Options	No ID Tag, No Calibration Certificate	00-00	0.00

Model Selection Guide

Description		Catalog Number	Price
7777D Mounting for Durafet® II ISFET Electrodes		07777D-	$0.00
Mounting Assemblies			
In-Line Mount	With 8550Ω Thermistor With 1000Ω RTD	04- 06-	275.00 275.00
Cap Adapter Cable Length	None 20 Feet (6,10 Meters) 50 Feet (15,24 Meters)	00- 04- 05-	0.00 275.00 325.00
UDA2182 Cable	20 Feet (6,10 Meters) 50 Feet (15,24 Meters)	06- 07-	180.00 265.00
Options	No ID Tag, No Calibration Certificate	00-00	0.00

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

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www.lesman.com
sales@lesman.com

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pH Electrodes and Mountings

7773 Electrode Mounting

- Corrosion-resistant polymer and 316 stainless steel housing with integral preamp
- Ultrasonic cleaning option for Meredian electrodes
- Widest range of electrode options — available with either Durafet or Meredian electrodes

The 7773 has the widest available range of electrode, automatic temperature compensator, and preamplifier options. It is ideal for high-purity water measurement with solution ground. The ultrasonic cleaner option is a plus for processes with scaling problems.

Mounting: Immersion or flow through, 3/4" NPTF connections

Materials of Construction: Ball valve, mounting nipple, and extension tube: 316 Stainless Steel or CPVC

Pressure/Temperature Rating: *Immersion:* Polypropylene: 100 PSIG at 140°F; Ryton, 316 SS: 100 PSIG at 176°F; *Flow through:* Polypropylene: 100 PSIG at 140°F; Ryton: 75 PSIG at 176°F; 316 SS: 150 PSIG at 176°F

TL1000 Twist Lock Mounting for Durafet II® Electrodes

- Quick quarter-turn installation and removal — fast, easy calibration and maintenance
- No electrode threading — no twisted cables
- Safe process mounting under pressure
- 3/4" or 1" threads — variety of mount options
- 316SS, Kynar, or CPVC mounting bushing — suitable for wide range of applications
- Dual external EPDM seals — prevents leakage
- Durafet II pH electrode — reliable, accurate measurement

Call Lesman for options, pricing, and availability.

Cost Savings Summary

☑ Replacement Electrodes — Durafet Quick Disconnect Cable Connector
- Replace electrode only
- Cable stays connected to instrument for fast start-up after replacement
- No pulling cables through conduit during replacement, removal, or installation

☑ Calibration and Maintenance — Twist Lock Mounting
- Cable remains connected (no warm-up time)
- No wrenches or special tools
- 1/4 turn eliminates twisted cables and broken conductors

Ordering Instructions

Make one selection from each table section below. A finished catalog number looks like this: 07773-_ _ - _ - _ _ - _ - _, _ _, _ _ _

Model Selection Guide

Description		Catalog Number	Price
7773 Mounting for Glass (Meredian) Electrodes		07773-	$0.00
For All pH Direct-Connection Instruments, No Preamp		20-	225.00
For All ORP Direct-Connection Instruments, No Preamp		30-	190.00
Use with Honeywell Microprocessor-Based Instruments for Glass pH Measurements. With Glass/ORP Electrode External Preamp Module.		60-	330.00
Immersion Mounting Materials	Polypropylene	2-	325.00
	Ryton	6-	425.00
	316 Stainless Steel	4-	630.00
Inline Mounting Material (Includes Mount Kit)	Polypropylene	1-	380.00
	Ryton	7-	515.00
	316 Stainless Steel Flow Chamber (with Polypropylene Cover)	5-	540.00
	316 Stainless Steel	3-	665.00
Electrodes (With Plug for Support)	No Electrode	00-	0.00
	Meredian-pH (50° to 212°F)	40-	245.00
	Meredian-pH and ORP (Gold) (50° to 212°F)	59-	760.00
	Glass pH Electrode (40° to 110°C)	22-	300.00
Automatic Temperature Compensator	None	0-	0.00
	Plug for ATC Hole for ORP Measurements or Fixed Temp. Compensation	1-	35.00
	Ryton (8550Ω, µ Processor Instrument)	5-	130.00
Options	No ID Tag, No Calibration Certificate	00-00	0.00

Model Selection Guide

Description		Catalog Number	Price
7773D Mount for Durafet® II ISFET Non-Glass Electrodes		07773D-	$0.00
Immersion Mounting Materials	Polypropylene	2-	290.00
	Ryton	6-	375.00
	316 Stainless Steel	4-	565.00
Inline Mounting Material (Includes Mount Kit)	Polypropylene	1-	340.00
	Ryton	7-	465.00
	316 Stainless Steel Flow Chamber (with Polypropylene Cover)	5-	490.00
	316 Stainless Steel	3-	595.00
Electrode Options	12mm Diameter, with 8550Ω Thermistor	01-	290.00
	12mm Diameter, with 1000Ω RTD	03-	290.00
Cap Adapter Cable Length	20 Feet (6,10 Meters)	04-	275.00
	50 Feet (15,24 Meters)	05-	325.00
UDA2182 Cable	20 Feet (6,10 Meters)	06-	180.00
	50 Feet (15,24 Meters)	07-	265.00
Options	No ID Tag, No Calibration Certificate	00-00	0.00

Accessories	pH Buffer Solution 4.01	31103001-501	$28.50
	pH Buffer Solution 6.86	31103002-501	28.50
	pH Buffer Solution 9.18	31103003-501	28.50

Honeywell

7774 Electrode Mounting

- Easy insertion or removal of electrode under pressure without interrupting the process
- Usable to 100 PSIG
- Rugged, corrosion-resistant insertion mounting of CPVC plastic or 316 stainless steel
- Durafet non-glass pH electrode option

The 7774 insertion/removal assemblies for Durafet II and Meredian II series combination (single-probe) pH or ORP electrodes are designed for use in processes under pressure. They can be inserted into a pipeline, tank wall, or other vessel, in any position.

Removal/insertion mountings and push-button switchover to a pre-calibrated backup probe provide safe, secure control over continuous pressurized processes.

The 7774 electrode mounting is compatible with both Meredian II glass electrodes for standard applications and Durafet solid-state electrodes for accurate readings in your harsh environment and sanitary applications.

Mounting: $1\frac{1}{4}$" NPT (316 Stainless Steel) or $1\frac{1}{2}$" NPT (CPVC) pipe nipple through ball valve.

Materials: *Ball valve, mounting nipple, and extension tube:* 316 SS or CPVC; *Seals:* Viton and Teflon

Pressure and Temperature Rating: *316 SS:* Determined by electrode; *CPVC:* 100 PSIG at 120°F

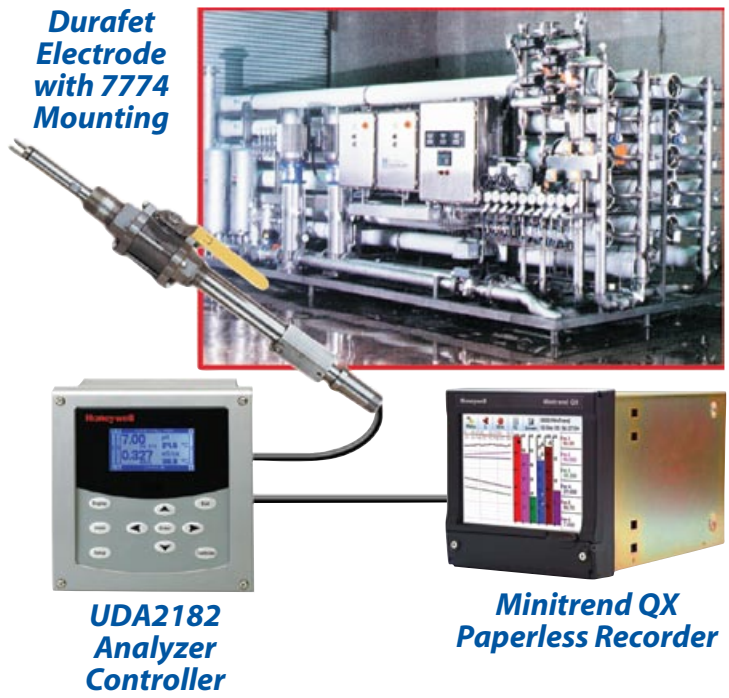
Ordering Instructions

Make a selection from each table section below. A finished catalog number looks like this: 07774-_ _ - _ _ - _ ,_ _ or 07774D-_ _-_ _ - _ _ - _ _ - _ ,- _ _

Model Selection Guide

Description		Catalog Number	Price
7774 Mounting for Glass (Meredian II) Electrodes		07774-	$0.00
CPVC Assembly: Use with Honeywell Analyzer, No Preamp. Direct Electrode Connect.		20-	697.00
CPVC Assembly: With Preamp and 20 Ft. Quick-Disconnect Cable. (Call for Longer Cable.)		70-	1045.00
316 SS Assembly: Use with Honeywell Analyzer No Preamp. Direct Electrode Connect.		40-	1330.00
316 SS Assembly: Use with Honeywell Analyzer, with Preamp and 20 Ft. Quick- Disconnect Cable.		80-	1750.00
No Electrodes		00	0.00
Meredian II pH Electrodes for CPVC Mounting			
	20 Ft. Tinned Leads, 32° to 176°F 20 Ft. Tinned Leads, 68° to 230°F 12" Quick Disconnect Leads, 32° to 176°F	23 25 21	345.00 475.00 310.00
Meredian II Electrodes (pH) for 316 SS Mounting			
	12 Ft. Tinned Leads, 32° to 176°F With ATC, 12 Ft. Tinned Leads, 50° to 176°F	01 08	245.00 305.00
Options	No ID Tag, No Calibration Certificate	00-00	0.00

Chemical Industry Application



UDA2182 Analyzer Controller

Minitrend QX Paperless Recorder

Model Selection Guide

Description		Catalog Number	Price
7774D Mounting for Durafet® II ISFET Non-Glass Electrodes		07774D-	$0.00
Ball Valve Assembly Materials	Plastic (CPVC) Stainless Steel None	01- 02- 00-	690.00 1225.00 0.00
Electrodes			
For Plastic Assemblies	3/4" Threaded, with 8550Ω Thermistor 3/4" Threaded, with 1000Ω RTD	01- 03-	290.00 290.00
For Stainless Assemblies	12mm Diameter, with 8550Ω Thermistor 12mm Diameter, with 1000Ω RTD	04- 06-	290.00 290.00
Cap Adapter Cable Length	None 20 Feet (6,10 Meters) 50 Feet (15,24 Meters)	00- 04- 05-	0.00 275.00 325.00
Durafet II Cable	20 Feet (6,10 Meters) 50 Feet (15,24 Meters)	06- 07-	180.00 265.00
Durafet III Cable	20 Feet (6,10 Meters) 50 Feet (15,24 Meters)	08- 09-	215.00 290.00
Options	No ID Tag, No Calibration Certificate	00-00	0.00

Accessories

Refill Kit for Durafet II Electrodes		51205807-501	$85.00
Solutions	pH Buffer Solution 4.01 pH Buffer Solution 6.86 pH Buffer Solution 9.18	31103001-501 31103002-501 31103003-501	$28.50 28.50 28.50

Learn more about Honeywell analytical instrumentation online at Lesman.com

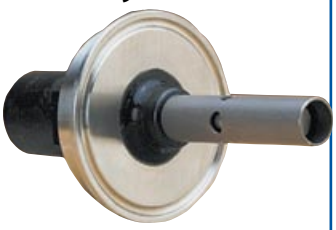
Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

Conductivity Cells and Assemblies

4973 and 4974 Conductivity Cells



- Insertion and CIP Mountings
- Great for Pure Water Processes
- Corrosion-Resistant Body

The 4973 and 4974 cells are ideal for pure water applications, giving you the accuracy you demand. Polyethersulfone (PES) construction, with electrodes of titanium or high-density graphite, increase resistance to corrosion.

These cells are flexible, designed for insertion, flow-through, direct installation into a process stream, or for use with a PES or stainless steel flow chamber in a bypass stream. For sanitary clean-in-place (CIP) piping systems, the 4794 cells include standard 1 1/2" or 2" CIP fittings.

Specifications

Cell Constants: 0.01, 0.1, 1.0 and 10 cm^{-1} with individual calibration factors

Temperature: *4973:* 284°F max. at rated pressure; *4974:* 266°F max.

Pressure: *4973:* 250 PSIG max. at rated temperature; *4974:* 150 PSIG max.

Automatic Temperature Compensation: Insertion available on all cells. *4973:* 3/4" NPT male thread for schedule 40 and 80 pipe; *4974:* 1 1/2" or 2" sanitary CIP fitting

Insertion Depth: 3 1/2" for 1, 10, and 0.01 constants from solution end of 3/4" NPT male thread; 2 1/2" for 0.1 constant

Wetted Parts: U.S. Food & Drug Administration compliant

Cell: *Body:* PES; *Electrodes:* 0.01 and 0.1 constant, titanium; 1.0 and 10.0 constant, high-density graphite with Teflon guard. 4974 also includes food-grade silicone rubber and polished 316 SS

Electrical Connections: Integral PVC-covered non-shielded 18-gauge 4-conductor cable, 7' or 20', as specified.

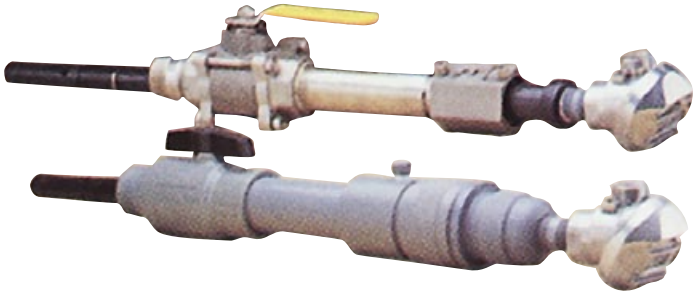
Ordering Instructions

Select the key number and options you need. Follow the arrows to be sure the unit is available. A finished catalog number looks like this:
04973-_ _ _-_ _ _-_ _-_ _-_ _ _

Model Selection Guide

Description		Catalog Number	Availability ↓	Availability ↓	Price
4973 Conductivity Cell		04973-			$ 0.00
4974 Sanitary Conductivity Cell		04974-			0.00
Cell Constant	0.01	001-	•	•	60.00
	0.10	X01-	•	•	60.00
	1.00	XX1-	•	•	0.00
	10.00	X10-	•	•	0.00
Insertion	Automatic Temperature Compensator	333-	•	•	340.00
Leadwire Length	20 Ft. Leadwire	20-	•	•	0.00
	Junction Box Head, Aluminum	X1-	•	•	70.00
CIP Sanitary Fittings	None	00-	•		0.00
	1.5" Clean-in-Place Fitting	15-		•	360.00
	2.0" Clean-in-Place Fitting	20-		•	435.00
Tagging 22 Char/Ln	None	0_ _	•	•	0.00
	Stainless Steel ID Tag (3 Line x 22 Char)	S_ _	•	•	35.00
No Documentation (Download from Lesman.com)		_00	•		0.00

Assemblies and Replacement Cells



- 316 Stainless Steel or CPVC Plastic
- Insertion Device Avoids Process Interruption

Honeywell 4909 conductivity assemblies let you insert or remove cells without interrupting your critical process. A restraining mechanism and an internal safety stop provide protection for safe removal at pressures to 50 PSIG. The plastic removal device uses a purge port to flush out accumulated debris.

Specifications

Cell Constants: 0.01, 0.1, 5.0, and 10, 20, 25, and 50cm^{-1}

Leadwire: 4 leads; Tefzel-covered; 18-gauge cable, 7' or 20'

Pressure: 200 PSIG max. at 284°F. *Removal or insertion:* 50 PSIG max.

Temperature: 284°F max. at 200 PSIG

Process Connection: 1 1/4" NPT male Stainless Steel, 1 1/2" NPT male CPVC

Length: *Insertion:* 4.5 to 6.9"; *Overall:* Process to connection, 16.6,"; 20.5" with junction box; *Total for Cell Removal:* 44.5"; 50.5" with junction box

Wetted Parts: 316 SS ball valve, Viton and Teflon internal sealing materials. *Body:* PES electrode, nickel or platinum

Ordering Instructions

Select the key number and options you need. A finished catalog number will look like this: 04909-_ _ _-_ _-_ _ _-_ _-_ _-_ _ _-_ _ _-_ _

Model Selection Guide

Description		Catalog No.	Price
4909 Complete Conductivity Cell Assembly		04909-	$ 0.00
4908 Replacement Cell Only		04908-	0.00
Cell Constant	0.01	001-	325.00
	0.10	X01-	325.00
	1.00	XX1-	320.00
	10.00	X10-	320.00
	50.00	X50-	320.00
Electrode Material	Nickel	33-	0.00
	Platinum	44-	380.00
Insertion	Automatic Temp. Compensator	333-	175.00
Leadwire Length	20 Ft. Leadwire	20-	0.00
	Junction Box Head, Aluminum	X1-	70.00
Valve/Cell Material	4909 Valve Assembly, Stainless Steel	02-	845.00
	4909 Valve Assembly, CVPC	03-	490.00
	4908 Replacement Cell (for SS Valve)	02-	0.00
	4908 Replacement Cell (for CPVC)	03-	0.00
Special Insertion Length	None	000-	0.00
	4.4" Extra Length (for SS Valves Only)	910-	105.00
	4909 SS Support Tube/PES Cell	930-	475.00
	4908 SS Support Tube/PES Cell	930-	0.00
Tagging 22 Char/Ln	None	0_ _	0.00
	Stainless Steel ID Tag (3 Line x 22 Char)	S_ _	35.00
No Documentation (Download from Lesman.com)		_00	0.00

Honeywell

Conductivity Cells and Assemblies

4905 Series

- Wide Range of Cell Constants
- Insertion or Immersion Mountings
- High Temperature and Pressure Limits

Made of corrosion-resistant PES, 4905 cells can be used with either nickel or platinum electrodes for continuous, reliable readings.

For insertion applications, the 1" NPT male thread allows installation in a pipe or tank. For flow applications, install the cell directly into a process stream or use with a separate flow chamber in a bypass stream. For immersion applications, 1/2" rigid or flexible plastic pipe is threaded into the top of the cell — up to 6' for 7' cable, up to 19' for 20' cable.

Specifications

Cell Constants: 0.01, 0.1, 5.0, and 10, 20, 25, and 50cm^{-1}

Temperature: 284°F max. at rated pressure

Pressure: 250 PSIG max. at rated temperature

Leadwire: 4 leads; Tefzel-covered; 18-gauge cable, 7' or 20'

Mounting: 1" NPT male lead

Length: *Insertion Depth:* 4.5" to 6.9", depends on cell constant; *Overall:* Approx. 6" to 8" (10 to 12 1/4" with junction head).

Wetted Parts: *Cell:* Polyethersulfone; *Electrodes:* Nickel or platinum

Ordering Instructions

Select the key number and options you need. A finished catalog number will look like this: 04905-_ _ _-_ _-_ _ _-_ _-_ _ _-_ _ _

Model Selection Guide

Description		Catalog Number	Price
4905 PES Corrosion-Resistant Conductivity Cell		04905-	$ 0.00
Cell Constant	0.01	001-	220.00
	0.10	X01-	220.00
	1.00	XX1-	215.00
	10.00	X10-	215.00
	50.00	X50-	215.00
Electrode Material	Nickel	33-	0.00
	Platinum (for Acid/Base Applications)	44-	360.00
Insertion	Automatic Temp. Compensator	333-	160.00
Leadwire Length	20' Leadwire	20-	0.00
	Universal Head Aluminum	X1-	70.00
Special Insertion	None	000-	0.00
	4.4" Extra Length	910-	105.00
Tagging 22 Char/Ln	None	0 _ _	0.00
	Stainless Steel I.D. Tag (3 Line x 22 Char)	S _ _	35.00
No Documentation (Download from Lesman.com)		_ 00	0.00
Accessories	PES Flow Chamber	276127	101.00

Visit our website for complete specifications.

Toroidal (Electrodeless) Sensors

- Immersion, Union, Insertion/Removal, or Sanitary Mounting
- PEEK, PFA, Teflon®, PVDF, or Polypropylene
- Pt1000Ω RTD Temperature Compensation

Honeywell's 5000TC sensor is designed for tough applications where coating, fouling, corrosion, or extreme conditions are a concern. The 1.5" diameter bore reduces rough surfaces for low flow impedance.

Specifications

Wetted Materials: *PFA Teflon, polypropylene, PVDF, or PEEK:* Brass, CPVC, Teflon valve seats, Viton O-ring seals; *Stainless steel:* 316 SS, Teflon valve seats, Viton O-ring seals

Maximum Flow Rate: 10 feet per second

Measuring Range: 0.2 to 2000 millisiemens/cm

Sensor Cable: 20-ft. long, 5-conductor (plus 2 isolated shields) cable with polyethylene jacket; rated to 302°F

Bore Size: 1.5" diameter, 0.4" hole

Operating Temperature Range: 14° to 257°F (10° to 125°C); **Mounting Temperature Limits:** *Plastic:* 23° to 176°F, 23° to 203°F when supported with bracket; *Stainless steel:* 23° to 203°F

Pressure/Temperature Limits: Sensor only. *Polypropylene:* 100 PSI at 212°F; *PVDF:* 100 PSI at 248°F; *PEEK/PFA Teflon:* 200 PSI at 302°F; **Mounting:** *Plastic:* 50 PSI at 90°C; *Stainless steel:* 100 PSI at 90°C

Ordering Instructions

Select the key number and options you need. A finished catalog number looks like this: 5000TC-_ _-_- 000

Model Selection Guide

Description		Catalog Number	Availability	Price
Toroidal (Electrodeless) Conductivity Probe		5000TC	↓	$0.00
Mount Material	No Mounting Assembly	00	•	0.00
	CPVC Pipe, PVC Junction Box	11	•	230.00
	CPVC Union Adapter, Standard 2" Tee	23	•	250.00
	CPVC Union Adapter Only	24	•	185.00
	CPVC Insertion/Removal Device	42	•	990.00
	PVDF Pipe, PVC Junction Box	12	•	540.00
	PVDF Union Adapter, Standard 2" Tee	25	•	660.00
	PVDF Union Adapter Only	26	•	485.00
	316SS Union Adapter, Standard 2" Tee	21	•	940.00
	316SS Union Adapter Only	22	•	735.00
	316SS Insertion/Removal Device	41	•	2210.00
	304SS Sanitary 2" Tee, Heavy-Duty Clamp	31	•	630.00
Sensor Material	No Sensor	0	•	0.00
	Polypropylene	1	a	880.00
	PVDF	2	a	1045.00
	PEEK	3	a	1110.00
	PFA Teflon	4	a	1245.00
	Sanitary Polypropylene Sensor	5	b	1000.00
	Sanitary PFA Sensor	7	b	1365.00
Other	For Future Use	000	•	0.00
Accessories	6-Conductor Interconnect Cable	51451255-001		4.45/ft.
	5000TC Product Manual	70-82-25-98		16.00

a Not available with sanitary mount. b Available only with sanitary mount.

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

HygroFlex5 Industrial Humidity/Temperature Transmitter

Rotronic's HygroFlex 5 transmitters measure humidity, temperature, and dewpoint. HygroFlex5 is ideal for all applications where exact measurement of humidity and temperature is critical.

The HF5 series is compatible with HygroClip2 probes with integrated AirChip3000 technology for unparalleled accuracy. HygroFlex HF5 transmitters take humidity and temperature measurement to a whole new level of performance (<0.02 %rH) and reliability (<0.8 %rH and <0.1 K).

A HygroFlex5 transmitter can be programmed with limits to generate an alarm that becomes available when the transmitter is communicating with a PC or compatible Rotronic device. In the event of a major sensor failure, the analog outputs can be set to a fixed value to indicate the alarm state. So, the HygroFlex5 can be integrated in any application.

Specifications

Models: *HF52:* Two-wire: *HF53:* Three- or four-wire; *HF55:* Digital

Probe Type: HygroClip2. See page 159 for full details.

Probe Cable Extension: Passive: max. 5 m, active 100 m

Accuracy at 23 ±5 °C: ±0.8 %rh / 0.2 K

Response Time: 3-12 s, depending on probe type

Startup: *HF52:* 10 seconds ; *HF53, HF55:* Typically 3 seconds

Measuring Range: -100° to 392°F, 0 to 100 %rH, probe dependent

Electronics Operating Range: -40° to 140°F / 0 to 100 %rH (14° to 140° F with LCD)

Display: Optional Graphic display with trend indicator, backlit with configurable parameters; *HF52:* No backlight

Alarm Functions: Programmable, open or shorted sensor

Output Signals: Scalable, 0 to 1, 0 to 5, or 0 to 10 V; 0/4 to 20 mA

Digital Outputs: Optional Ethernet (LAN, WLAN), USB, RS485

Power Supply: *HF52:* 10 to 28 VDC: 10 V + (0.02 x load); *HF53/55:* 15 to 40 VDC / 12 to 28 VAC

Power Consumption: *HF52:* 40 mA max; *HF53:* <100mA; *HF55:* <300mA

Min/Max Load: V-signal: ≥1kW/V / mA signal: ≤ 500 W with load compensation

Firmware Update: Via service connector, requires HW4 software

Sensor Diagnostics: Drift, state; Programmable, default: off

Air Velocity: 20 m/sec max at probe

Adjustments: *Humidity:* With keypad / software: multipoint; *Temperature:* With keypad; 1 point, by software: 2 points

Datalogging: External, 2000 data point memory

Psychrometric Calculations: All selectable

PC Interface: With service connector cable

Data Processing by HW4: Graphs, statistics, analysis, qualification

Construction: IP65-rated ABS plastic housing, compliant to UL94-HB; One x M16 x 1.5 cable connections on terminals

Standards: CE compliant, 2007/108/EG

Audit Trail, Electronic Records: FDA CFR21 Part 11 and GAMP compliant

Features

- Relative humidity and temperature measurement with dew-point and other psychrometric calculations
- Two freely selectable and scalable analog outputs
- Digital output option for integration on a network via RS485 or Ethernet – wired or wireless
- Easy-to-read backlit LCD shows measured values and trends
- Compatible with all HygroClip2 probes; Uses probe simulators allows easy process validation
- Auto-diagnostics and automatic correction; Compensates humidity and temperature over 30,000 reference points

Ordering Instructions

Select the key number and options you need. A finished catalog number will look like this: HF5 _ _ - _ _ _ _ _ _ X X.

Probes are ordered separately. See page 159 for full probe specifications.

Model Selection Guide

Description		Catalog Number	Price
Circuit and Output	2-Wire Loop Power, 4-20 mA Output	HF520-	$300.00
	3-Wire, Line Power, 0-20 mA Output	HF531-	300.00
	3-Wire, Line Power, 4-20 mA Output	HF532-	300.00
	3-Wire, Line Power, 0-1V Output	HF533-	300.00
	3-Wire, Line Power, 0-5V Output	HF534-	300.00
	3-Wire, Line Power, 0-10V Output	HF535-	300.00
Mount	Duct, Probe: 208mm x 15mm Diameter	D _ _ _ _ _ _ _	0.00
	Wall, Probe: 85mm x 15mm Diameter	W _ _ _ _ _ _ _	0.00
Analog Output	Humidity and Temperature	_ B _ _ _ _ _ _	0.00
	Humidity Only	_ H _ _ _ _ _ _	0.00
Temp Output	0° to 100°F	_ _ 6 X _ _ _ _	0.00
	0° to 200°F	_ _ 7 X _ _ _ _	0.00
	0° to 300°F	_ _ 8 X _ _ _ _	0.00
	-50° to 200°F	_ _ 9 X _ _ _ _	0.00
Options	Keypad and Display	_ _ _ _ D _ _ _	175.00
	No Keypad or Display (Blind Transmitter)	_ _ _ _ X _ _ _	0.00
Analog Signal Cable Fittings	One M16 Cable Gland for Supply/Signal	_ _ _ _ _ 1 _ _	0.00
	One M16 Cable Gland, Vertical Mount	_ _ _ _ _ 2 _ _	0.00
	Conduit Adapter for Supply/Signal	_ _ _ _ _ 3 _ _	0.00
	Conduit Adapter, Vertical Mount	_ _ _ _ _ 4 _ _	0.00
Comms Signals Links	RS485 Link, M16 Cable Gland, +1 Item	_ _ _ _ _ 5 X X	100.00
	RS485 Link for Conduit Adapters	_ _ _ _ _ 6 X X	100.00
	USB, RS485, M16 Cable Gland, Horiz Mt	_ _ _ _ _ 7 X X	100.00
	USB, RS485 for Conduit, Horizontal Mt	_ _ _ _ _ 8 X X	100.00
Accessories to Order as Separate Line Items			
Standard Probe, -40° to 212° Range		HC2-S	325.00
PPS Barrel, 250mm Length, -148° to 392°, 2M Cable		HC2-IC302	925.00
SS Barrel, 250mm Length, -148° to 392°, 2M Cabl		HC2-IM302	1125.00
DIN-Rail Mounting Kit (DIN Rail Not Included)		AC5002	25.00
Duct Mounting Flange, Max 100°C		AC5005	15.00
Duct Mounting Flange, Max 200°C		QMA-15	50.00
Standard Filter, Polyethylene Insert		NSP-PCB-PE	25.00
Filter, Wire Mesh Insert (Faster Response Time)		NSP-PCB-WM	25.00
Filter, Teflon Insert (High Humidity, Low Air Flow)		NSP-PCB-TF	50.00
2M Data Extension Cable		E2-02A	125.00
5M Data Extension Cable		E2-05A	140.00
Active UART to USB Converter Cable		AC3001	210.00
Service Cable, Mini-USB to USB-A Converter		AC3006	125.00
HW4 Software CD-ROM, Single User License		HW4-E	250.00

Need dewpoint or wet bulb temperature output? Call Lesman.
Looking for a different probe or NIST calibration? See page 159.

HygroLog2NT Advanced Humidity/Temperature Datalogger

Features

- Monitors and logs relative humidity, temperature, dewpoint or other calculated parameter
- Proven sensor technology provides maximum accuracy of ±1.0 % RH /±0.2 °C
- Networkable, data retrieval via a network (Ethernet/RS485)
- FDA 21 CFR Part 11 and GAMP 4 compliant software
- Compact Flash memory card for virtually unlimited logging
- Available with Bluetooth wireless transceiver

The Digital Advantage

The HygroLog NT uses the latest in digital technology. Digital signal processing of the HydroClip probes significantly benefits humidity and temperature measurement in the following key areas:

Measurement Accuracy — Digital processing of the sensor signals by the HygroClip probe and associated electronics provides more scope and greater flexibility when compensating sensor characteristics such as linearity and temperature coefficient. The Rotronic Hygrometer capacitive humidity sensor has always been the leader in both precision and stability. With the application of digital technology, sensor performance is now further enhanced.

Maintenance and Calibration — Unique HygroClip digital technology virtually eliminates downtime during maintenance. When it is time for a scheduled calibration, the HygroClip2 probe can be "hot swapped" in seconds with a calibrated replacement HygroClip2 probe. There is no need to remove the complete instrument to the calibration laboratory.

With a variety of models and options, the HygroLog NT is suitable for a variety of industrial, research, and commercial applications. HygroLog NT features up to seven probe inputs, network capability, and complies with FDA 21 CFR Part 11 and GAMP4 requirements.

Specifications

Internal humidity/temperature probe: Plug-in Rotronic HygroClip S

Operating limits: *Electronics:* 0–100 % RH / -22°–158° F, 14°–140° F with display; *Alkaline battery:* 14°–122° F; *Lithium battery:* -22°–158° F

Measuring range: *Internal probe:* 0–100 % RH, same temperature limits as logger; *External probes:* HygroClip probes are available for ranges within 58°–392° F (-50°–200° C).

Accuracy at 23°C (internal probe): ±1.5 % RH /±0.2°C

Power supply: *Internal:* 9V battery, 500 mA; *External:* Via docking station

Battery lifetime: >1 year, without display, 1 probe, 15 min. log interval

Internal menu: Simplified functions, viewing of logged data

Probe adjustment: *Internal:* Direct from internal menu; *External:* Direct from internal menu (HygroClip probes only)

Docking station: Up to 4 probes; HygroClip probes, analog probes, or RTD probes (Pt100) and 2 digital signals (depends on model)

Plug-in memory: Compact flash card (16 MB standard - up to 1 GB); Capacity: (16 MB CF card): 400,000 points in text format, 752,000 points in encoded binary format

Log interval: Programmable from 5 seconds to 24 hours; *Mode:* Start/Stop, with programmable date and time

Event logging: Last 170 events such as configuration changes, alarm

Alarm function: Optical and acoustical, programmable

Housing: ABS, protection grade IP65 / NEMA 4

CE Approvals: EN 61000-6-3, EN 61000-6-1, EN61000-6-4, EN 61000-6-2

System requirements for HW4: Pentium 2, 450 MHz, 128 MB RAM, Min. 50 MB hard disk, VGA or SVGA monitor. *Operating systems:* Windows 98SE, XP, NT4 SP6a or higher, 2000 SP2 or higher, Server 2003 or higher

Model Selection Guide

Description	Catalog Number	Price
HygroLog NT2 (One Input) Temperature/Humidity Datalogger		
No Display or Probe	Hygrolog NT2-NP	$525.00
With Display, No Probe	Hygrolog NT2D-NP	575.00
With Display and Bluetooth, No Probe	Hygrolog NT2D-BT-NP	895.00
No Display, with HC2-S Probe	Hygrolog NT2	775.00
With Display and HC2-S Probe	Hygrolog NT2D	825.00
With Display, Bluetooth, HC2-S Probe	Hygrolog NT2D-BT	1145.00
HygroLog NT3 (Three Inputs) Temperature/Humidity Datalogger		
No Display or Probe	Hygrolog NT3-NP	645.00
With Display, No Probe	Hygrolog NT3D-NP	695.00
With Display and Bluetooth, No Probe	Hygrolog NT3D-BT-NP	1015.00
No Display, with HC2-S Probe	Hygrolog NT3	895.00
With Display and HC2-S Probe	Hygrolog NT3D	945.00
With Display, Bluetooth, HC2-S Probe	Hygrolog NT3D-BT	1265.00
Accessories		
HygroClip2 Standard Probe -40° to 212° Range	HC2-S	325.00
2M Probe Connection Cable	MOK-02-B5	105.00
5M Probe Connection Cable	MOK-05-B5	125.00
2M Extension Cable	MOK-02-DAT05	125.00
5M Extension Cable	MOK-05-DAT05	140.00
AC Adapter 100-240 VAC/12 VDC	AC-1211	50.00
HygroLog NT Desktop Stand	NT-Desk	65.00
HW4 Software, Single User Edition	HW4-E	250.00
Docking Stations with No Probe Inputs		
Docking Station, AC Adapter	DS-NT1	95.00
Docking Station, RS232/485, AC Adapter	DS-NT2	275.00
Docking Station, USB/RS485, AC Adapter	DS-NT3	275.00
Docking Station, Ethernet, RS485, AC Adapter	DS-NT4	595.00
Docking Stations with Four Probe Inputs		
Docking Station, RS232/485, AC Adapter	DS-U1	550.00
Docking Station, USB/RS485, AC Adapter	DS-U2	550.00

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

HygroPalm2 Portable Humidity/Temperature Indicators

Features

- Relative humidity and temperature measurement; Dewpoint and psychrometric calculations
- Compensates humidity and temperature over 30,000 reference points
- Outstanding accuracy, repeatability
- 2000 data point memory
- Auto-diagnostics and automatic sensor correction
- Compatible with Rotronic HW4 software for graphing, statistics, analysis, qualification, and configuration
- Models available with integrated or interchangeable probes

Rotronic's HygroPalm2 series is the latest development in handheld measuring instruments for relative humidity temperature and dewpoint. Based on AirChip3000 technology, this indicator achieves a degree of accuracy not seen before in a portable rH monitor.

HygroPalm2-series provides superb precision and state-of-the-art functionality, taking humidity and temperature measurement to a whole new level of performance and reliability (<0.8 %rH / 0.1 K).

Three different adjustment profiles are available; so the measuring accuracy can be matched to your specific application needs. A custom adjustment profile consists of 20 humidity values at 3 temperatures to ensure optimum performance over a required working range. The date is stored on the AirChip and can be retrieved later for audit purposes.

The intelligence of AirChip3000 technology enables advanced sensor diagnostics. Should the sensors deviate from factory defined parameters, measurement values can be compensated automatically and a digital alarm triggered on the display.

Up to 2,000 measurement values can be stored in the HygroPalm21 or in the HygroClip2 probe when used with the HygroPalm22. The user can configure the measurements interval, set alarm limits, scale the output signal and download data using optional ROTRONIC HW4 software.

Probes for HygroPalm22

Whether you need a simple direct-mount climate probe for measuring ambient conditions or a more sophisticated cable probe for high temperatures and other special applications, there's a HygroClip2 probe to meet you requirements.

All HygroClip2 probes can be individually calibrated and adjusted to increase measurement precision where you need it the most.

Standard Climate Probes: Probes with maximum accuracy, operating range -40° to 212°F

Mini Probes: 4mm and 5 mm probes for monitoring confined spaces

High Temperature Probes: Hand-held probes for applications to 392°F; Probe length 250 and 400 mm, diameter 15mm

Sword Probes: For measuring in paper, cardboard and textile stacks

Specifications

Probe Inputs: *HP21:* Integrated sensors; *HP22:* Any one HygroClip2® sensor (interchangeable models)

Humidity Sensor: *HP21:* Hygromer® IN-1; *HP22:* Depends on probe

Temperature Sensor: *HP21:* Pt100 1/3 Class B; *HP22:* Depends on probe

Probe Cable Extension (HP22 Only): Max. 5 m, active 100 m

Accuracy: *HP21:* ± 1.0%rH / ± 0.2 K.; *HP22:* Depending on probe and adjustment profile

Resolution AirChip3000: < 0.02 %rH / 0.01 K

Long-Term Stability: *Humidity sensor:* < 1 %rH / year

Response Time: *HP21:* <10 seconds; *HP22:* Depends on probe

Startup Time: Typically 3 seconds

Measuring Range: *HP21:* 14° to 140° F, 0 to 100 %rH; *HP22:* -58° to 392° F

Display: Graphic display, backlit, with trend indicator and low battery indicator

Power Supply: 9 V battery / AC power adapter

Power Consumption: Typically 4mA with backlight off

Firmware Update: Possible via HW4 software

Sensor Diagnostics: Drift, state programmable, off by default

Sensor Protection: *HP21:* Polyethylene filter; HP22: Depends on probe

Air Velocity at Probe: *HP21:* 20 m/sec max; HP22: Depends on probe

Probe Adjustment: From keypad: *HP21:* 1-point offset; HP22: Multipoint

Datalogging: 2000 datapoint memory: *HP21:* Internal; HP22: In probe

Psychrometric Calculations: *HP21:* Dewpoint; HP22: All available

PC Interface: Via Rotronic Interface cable

HW4 Software Capabilities: Firmware updates plus data processing (graphs, statistics, analysis, qualification)

Housing: ABS plastic, IP40 rated, complies with UL94-HB for fire protection

Audit Trail and Electronic Records: FDA-CFR21 Part 11, GAMP compliant

Approvals: CE-compliant, 2007/108/EG

Model Selection Guide

Description	Catalog Number	Price
HygroPalm 21: Fixed Probe Model for Humidity, Temperature, Dewpoint, Frost Point. Backlit LCD	HP21	$295.00
HygroPalm 22: Interchangeable Probe Model for Humidity, Temperature, and Full Psychrometric Calculations. Backlit LCD. Probe Sold Separately.	HP22	445.00
Calibration Device Kit with Solutions and Case	Palm22 Set	1095.00
Carrying Case, HygroPalm21	AC1122	50.00
Carrying Case, HP22 + HC2-S Probe	AC1116	110.00
Carrying Case, HP22 + Any Probe (Except HC2-HK40)	AC1117	175.00
2M Data Extension Cable	E2-02A	125.00
5M Data Extension Cable	E2-05A	140.00
Service Cable, Mini-USB to USB-A Converter	AC3006	125.00
HW4 Software CD-ROM, Single User License	HW4-E	250.00

Probe ordered separately. See page 159.

rotronic
LEADING IN HUMIDITY MEASUREMENT

HygroClip2 Digital Humidity Probes

Features

- For relative humidity, temperature measurement and dew-point calculation
- Outstanding accuracy and repeatability
- Integrated data acquisition and calibration history — 2000-point data memory
- Sensor auto-diagnostics with automatic correction and error compensation; Compensates humidity and temperature over 30,000 reference points
- Programmable alarm functions with active alarming
- Advanced easy-to-use calibration features
- 100% field interchangeable without adjustment

When it comes to measuring humidity with the highest accuracy(<0.8 % rh / 0.1°K), Rotronic's HygroClip2 probe is in a class of its own. Whether you need a simple climate probe for measuring ambient conditions, or a more sophisticated cable probe for high temperature or other special applications, Rotronic has a HygroClip2 probe to suit your needs.

All HygroClip2 probes can be individually calibrated and adjusted to maximize measurement precision where you need it the most. This capability is exactly what makes every probe in the product range a high-end solution for your application.

Three different adjustment profiles are available from the factory, so measurement accuracy can be matched to your application need. Calibration data is stored in the probe and can be retrieved later for audit purposes.

To rescale HygroClip2 to a different range, connect it to a PC with HW4 software. You can also assign the internally calculated dew or frost point value to an output, converting the HygroClip2 into a dewpoint probe.

If the RH sensor deviates from factory defined parameters (e.g., due to chemical contamination), measurement values can be automatically compensated and a digital alarm triggered. Using Rotronic's HW4 software, you can program HygroClip2 to generate an alarm as an analog output signal in the event of a problem with either the RH or temperature sensor.

Up to 2000 measurement values can be stored in the HygroClip2 probe. Using Rotronic HW4 software, you can configure the measurement interval, set alarm limits, scale the output signal and download data. The HygroClip2 probe can be programmed with set limits to generate an alarm that is available when the probe is communicating with a PC or compatible Rotronic device.

Specifications

Measuring Range: 0 to 100 %rH, -148° to 392° F (depending on probe)

Sensors: *Humidity:* Hygromer® IN-1; *Temperature:* Pt100 1/3 Class B

Accuracy at 23°C: *Standard profile:* 10, 35, 80 %rH ±0.8 %rH / ±.01K; *High precision profile:* 10, 20, 30, 40, 50, 60, 70, 80, 90 %rH ±0.5 %rH / 0.1K; *Custom profile:* Three selectable temperatures from -10° to 70°C and 20 freely selectable %rH values (10 to 90 %rH) ±0.5 %rH /0.1K

Resolution: Typically 0.02 %rH, 0.01 K

Long-Term Stability: <1 %rH, 0.1°C/year

Humidity Response Time: 3 to 12 seconds (depending on probe)

Electronics Operating Range: -50° to 100°C and 0 to 100 %rH

Analog Output Signals: User scalable, 0–1V = 0–100 %rH or -40° to 140° F

PC Interface: UART standard with Rotronic interface cable

Sensor Diagnostics: Programmable, factory default = off)

Alarm Function: Analog and digital, programmable

Power Supply and Consumption: 3.2 to 5 VDC±0% / typically 4 mA

Materials: *Housing/probe:* Polycarbonate or stainless steel (depends on probe type); *Filter:* Polyethylene insert, polycarbonate cage

Audit Trail and Electronic Records: FDA 21CFR Part 11, GAMP compliant

Standards: CE-compliant 2007 / 1085 / EG

Model Selection Guide — HygroClip2 Probes

Probe Style	Range (°F)	Cable Length	Catalog Number	Price
Standard Probe	-40° to 212°	—	HC2-S	$325.00
Mini Probe, Penetrating Tip	-40° to 185°	2M	HC2-C04	895.00
Mini Probe	-40° to 185°	2M	HC2-C05	795.00
High Temp Probe	-40° to 302°	2M	HC2-HK25	895.00
High Temp Probe	-40° to 392°	2M	HC2-HK40	995.00
Mini Insertion Probe	-40° to 185°	2M	HC2-P05	895.00
Insertion Probe	-40° to 185°	2M	HC2-HP28	995.00
Sword Probe	-40° to 185°	2M	HC2-HS28	995.00
PPS Barrel, 117mm Length	-148° to 392°	2M	HC2-IC102	875.00
PPS Barrel, 250mm Length	-148° to 392°	2M	HC2-IC302	925.00
PPS Barrel, 400mm Length	-148° to 392°	2M	HC2-IC402-A	1125.00
SS Barrel, 100mm Length	-148° to 392°	2M	HC2-IM102	1055.00
SS Barrel, 250mm Length	-148° to 392°	2M	HC2-IM302	1125.00
SS Probe, Pressurized Envir.	-148° to 392°	—	HC2-IE3M02	1275.00

Model Selection Guide — HygroClip2 Accessories

Description	Catalog Number	Price
Mounting Flange, 15mm Dia. Probes, Max 100°C	AC5005	$15.00
Mounting Flange, 15mm Dia. Probes, Max 200°C	QMA-15	50.00
2M Data Extension Cable	E2-02A	125.00
5M Data Extension Cable	E2-05A	140.00
Active UART to USB Converter Cable	AC3001	210.00
Service Cable, Mini-USB to USB-A Converter	AC3006	125.00
HW4 Software CD-ROM, Single User License	HW4-E	250.00
Calibration Cert: 2-Point NIST (35-80% rH)	2PT-RHCERT	75.00
Calibration Cert: 3-Point NIST (35-80-0% rH)	3PT-RHCERT-0	100.00
Calibration Cert: 3-Point NIST (35-80-10% rH)	3PT-RHCERT-10	100.00
Calibration Cert: 4-Point NIST (35-80-10-0% rH)	4PT-RHCERT	125.00
Calibration Cert: 1-Point NIST (Ambient Temp)	TEMPCERT	60.00

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

Loop-Powered Dewpoint Transmitters

Two-Wire Dewpoint Transmitter with Local Digital Display

COSA's Model LPDT is the world's smallest loop powered (two-wire) dewpoint transmitter with a display. It's a fully functional instrument operated through a mini custom LCD display and three push buttons, using the same user friendly interface of all Xentaur hygrometers. The user-configurable analog output is linear to the engineering units selected for display. A weatherproof cap is available for outdoor NEMA 4X (IP65) applications.

The model LPDT uses a Xentaur HTF™ (hyper thin film) Aluminum Oxide sensor. The breakthrough HTF sensor represents advances in thin film and metal oxide sciences and offers significant performance advantages over all other aluminum oxide sensors.

The HTF aluminum oxide sensor features a hygroscopic layer of aluminum oxide that adsorbs or releases water molecules within its pores, depending on the water vapor pressure in its environment. The electrical capacitance of the aluminum oxide layer changes with the surrounding water vapor pressure. The electrical capacitance is measured between the aluminum core of the sensor and a porous conductive gold layer on the outside.

HTF sensors have a capacitance change measurably larger than that of conventional aluminum oxide sensors due to the hyper thin film, a sharp transition layer and a special pore geometry. Plus, its sensitivity to temperature is negligible.

A linear high capacitance response offers better sensitivity, better repeatability and faster response times. The measurement system is less prone to noise and drift, and signal conditioning is kept to a minimum.

Specifications

Sensor Type: *Dewpoint:* Hyper Thin Film high capacitance Al_2O_3 ; *Temperature:* Precision integrated circuit sensor

Dewpoint Range: *XTR-100:* -148° to 68°F; *XTR-65:* -85° to 68°F

Temperature Range: -14° to 158°F

Capacitance: 15nF to 200nF

Accuracy: ± 5.5°F

Repeatability: ±0.9°F

Sample Flow Range: (Linear velocity @ 1 atm.)Static to 100 m/s

Input Resolution: 0.1°C (dp)

Engineering Units: °C, °F, PPM, Lbs H_2O/mm SCF, gm H_2O/M^3

Indicators: 3.5 digit LCD with custom legends

Controls: 3 push buttons, all setting stored in EPROM

Outputs: 4-20mA analog output, can be used to operate alarm relays

Isolation: Sensor and case are isolated from the current loop and shunted with 33V transorbs

Enclosure: Stainless Steel, weather proof cover available

Pressure Range: 0-500 PSI or 0-5,000 PSI (optional)

Electrical Connections: 2.1mm power jack with retainer

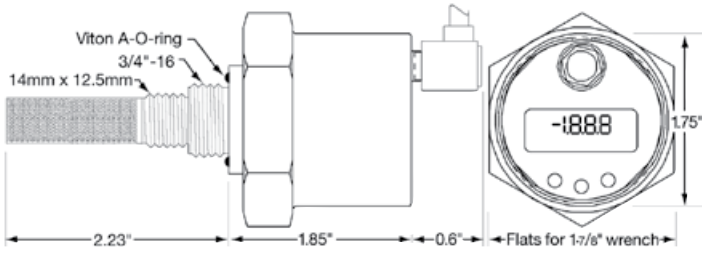
Mechanical Connections: 3/4" x 16 threads

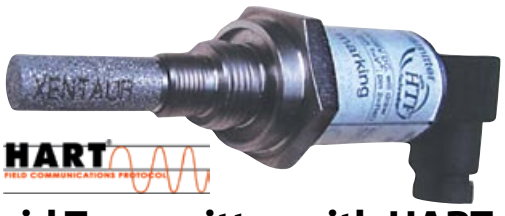
Cable: Two conductor cable

Power Requirements: 10 to 33 VDC, the instrument draws 4-20mA depending on measured dewpoint.

Calibration Method: Autocal. Sensor saturates at dewpoint above 68°F (20°C). NIST/NPL traceable factory multipoint calibration available.

Dimensions





Hybrid Transmitter with HART

COSA's model HDT is a HART®-compliant IP66/NEMA 4X dewpoint transmitter with loop powered analog and digital outputs.

Prices start at $1425.00

Model Selection Guide

Description	Catalog Number	Price
Loop-Powered Transmitter with LCD (LPDT)		
Range: -149°/68°F (-100/20°C) Range: -85°/68°F (-65/20°C)	LPDT-XT100 XR71100 LPDT-XT65 XR71065	1890.00 1570.00
Accessories		
LPDT Transmitter Instruction Manual	XR10005	28.00
Sample Cell (S/S) with 1/4" Tube Fittings	XR19093	160.00
1/2" NPT Mounting Adapter for SS Sensor	XR02055	114.00
Cartridges for XR06017 Filter (10/Pkg)	XR06018	139.00
Needle Valve, Stainless Steel to 3000 PSIG	XR06025	127.00

Dewpoint Transmitters

XDT Digital Dewpoint Transmitter

COSA dewpoint transmitters will continually monitor air dryer performance, compressed air quality and dry gas moisture, from ambient dewpoint levels to temperatures as low as -148°F (-100°C).

The XDT is operated through a menu-driven, backlit LCD display with four pushbuttons. Results are displayed at (atmospheric) sensor pressure or line pressure. Field calibration is fully automated — you're prompted through a simple one-minute procedure that requires no additional equipment. The XDT has indication for sensor open, short or electronic system failure, which can activate any of the alarm relays.

The two optional alarm relays can be independently programmed to switch at any dewpoint with variable hysteresis, making the transmitter ideally suited as an energy saving controller for desiccant dryers in dewpoint demand mode. Relay status is shown on the display with flashing HI or LO indicators while displaying the dewpoint.

Specifications

Sensor Type: Hyper Thin Film high capacitance Al_2O_3 (*See page 101 for Sensor Specifications)

Indicators: LCD with optional backlight, 3.5 digits and custom legends for units and mode, audio alert

Engineering Units: °F and °C, ppm, Lb H_2O

Controls: 5 push buttons, all settings stored in EEPROM

Output Options: 4-20mA or 0-24mA outputs, linear selected engineering units, programmable span and range, 0.1°C dewpoint resolution. (RS-232 optional, baud rate 9600

Isolation: Sensor is isolated from power supply, analog output and RS-232

Alarm Relays: Two alarm relays with variable hysteresis, rated at 10A @240V; Failure indication programmable to trigger alarm relays

Power Requirements: 100-240 VAC, 50 or 60 Hz, auto-ranging

Connections: Pluggable screw terminal block

Enclosure: Polycarbonate NEMA 4, 4X, or DIN 43700

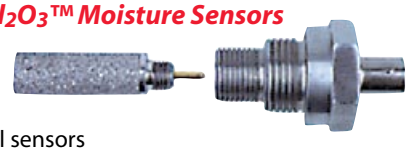
Temperature Range of Electronics: 14° to 122°F (-10 to 50°C)

Model Selection Guide

Description	Catalog Number	Price
Field-Mount Dewpoint Transmitter (XDT)		
Range: -85°/68°F (-65/20°C) NEMA 1 Panel Mt	XDT-XT65-PM	$2850.00
Range: -85°/68°F (-65/20°C) NEMA 4 Wall Mt	XDT-XT65-NEMA	2850.00
Range: -149°/68°F (-100/20°C) NEMA 1 Panel Mt	XDT-XT100-PM	3100.00
Range: -149°/68°F (-100/20°C) NEMA 4 Wall Mt	XDT-XT100-NEMA	3100.00
Accessories		
1/2" NPT SS Mounting Adapter for XDT	XR02055	114.00
Stainless Steel Needle Valve to 3000 PSIG for XDT	XR06025	127.00
Sample Cell (S/S) with 1/4" Tube Fittings for XDT	XR19093	160.00
Cartridges for XR06017 Filter (10/Pk)	XR06018	139.00
36" Braided Hose w/SS End Connections	XR10043	158.00

Learn more about COSA dewpoint transmitters at www.Lesman.com

Hyper-Thin-Film (HTF) Al_2O_3™ Moisture Sensors



- Field calibration without reference standards
- Up to 600 times more sensitive than conventional sensors
- Faster response, less drift, better repeatability, and negligible temperature effect

XPDM Portable Dewpoint Meter

Cosa's XPDM is a battery operated, handheld portable dewpoint meter designed for applications where quick and accurate dewpoint measurements have to be made.

Accurate spot checks of moisture in air or gases can be made over the range of -148° to 68°F dewpoint.

The XPDM sensor is separated from the desiccant by a very fine stainless steel mesh with a thickness of approximately 5 mil. Close proximity of the sensor to the desiccant is crucial for fast dry-down.

The pressure of the sample flow pushes the piston and pulls the sensor into the sample cell, where it wets quickly to the moisture content. You can take an accurate reading within two minutes. An actuator pushes the sensor back into the dry storage position.

All surfaces in contact with the sample cell are made from electropolished 316 stainless steel to ensure rapid equilibrium. Sensor and piston slide through the spring-loaded PTFE seals protecting the sample cell as well as the desiccant cartridge from intrusion of wet air or gas.

Specifications

Sensor Type: Hyper Thin Film high capacitance Al_2O_3

Input Resolution: 0.1°C dewpoint

Indicator: Backlit 3.5 digit LCD, custom legend for units, mode, audio alert

Engineering Units: °C, °F, PPM, Lbs H_2O/mm SCF, gm H^2O/m^3

Controls: 5 pushbuttons. Manual sensor actuator

Outputs: 4-20mA or 0-24mA, (RS-232 optional)

Enclosure: Anodized Aluminum, Regulator and Filter mounting facilities; Optional approval for use in Class I, Div. 1, Groups A–D hazardous areas .

Pressure Range: 0-28 PSI or 0-100 PSI (optional)

Electrical Connections: 9-pin D for analog, (RS-232 optional)

Power Requirements: 9v battery, *Battery Saver:* Auto power off after 6 minutes; Optional 15-25V AC or DC wall transformer

Pressure Correct: Programmable pressure correction button

Model Selection Guide

Description	Catalog Number	Price
Portable Dewpoint Meter (XPDM)		
Range: -100°/20°C	XR71110	4575.00
Range: -100°/20°C with RS232	XR71111	5410.00
Range: -100°/20°C Intrinsically Safe	XR71112	5200.00
Option: 4-Point NIST Traceable Calibration	-NIST	500.00
Accessories		
Cartridges for XR06017 Filter (10/Pk)	XR06018	139.00
XPDM Instruction Manual	XR10020	39.00
Carrying Case	XR10024	211.00
36" Braided Hose w/SS End Connections	XR10043	158.00

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

K-PATENTS PROCESS INSTRUMENTS

Process Refractometers for In-Line Concentration

See Page 163

See Page 164

See Page 165

K-Patents Process Refractometers Fit Any Process

K-Patents' new PR-23 process refractometers are an affordable choice for a variety of processes. A new dual connectivity feature lets any two PR-23 sensors be connected to a single model DTR indicating transmitter.

Sanitary compact refractometer PR-23-AC

A compact 3A approved refractometer for pipelines especially suitable for food and beverage processes.

Sanitary probe refractometer PR-23-AP

The K-Patents Sanitary probe refractometer PR-23-AP-RSS/TSS provides an accurate on-line BRIX measurement in tanks and vessels.

Sanitary flush mounted refractometer PR-23-APP

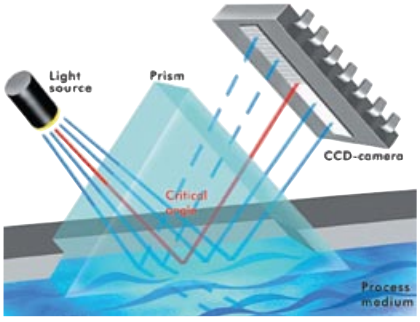
The K-Patents Sanitary flush mounted refractometer PR-23-APP provides an accurate on-line BRIX measurement in cookers and tanks. The sensor is flush mounted in the side wall, which allows the use of scrapers. It is also easily installed through a steam jacket.

Process probe refractometer PR-23-GP

The K-Patents Probe process refractometer PR-23-GP provides an accurate on-line concentration measurement in large pipes and various tanks and vessels.

Teflon body refractometer PR-23-M

An instrument with a specially designed flow cell (of Teflon® or Kevlar®) for measuring chemically aggressive solutions that corrode, foul or otherwise destroy metal parts, as well as for ultra-pure fine chemical processes where metal parts cannot be used.



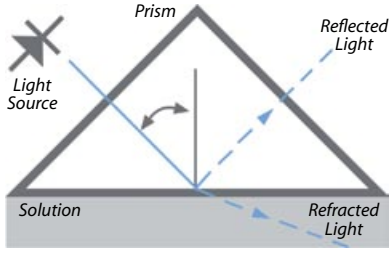
Is a process refractometer right for you? Get a K-Patents application datasheet from www.Lesman.com/datasheets and send it to Lesman for engineering review. We'll help you get the system that best fits your needs.

Need a Brix table or the refractive index of a common material? See page 485.

Saunders body refractometer PR-23-W

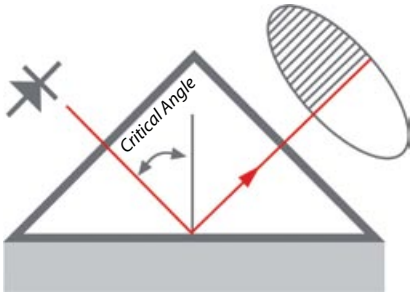
A heavy-duty instrument specially designed for measuring concentrations of chemically aggressive liquids in large-scale production and in large pipelines (diameter 50, 80 or 100mm/2", 3" or 4"). Also for HF applications and other solutions that corrode or foul metal parts, as well as for ultra-pure fine chemical processes where metal parts cannot be used.

Measurement Principle



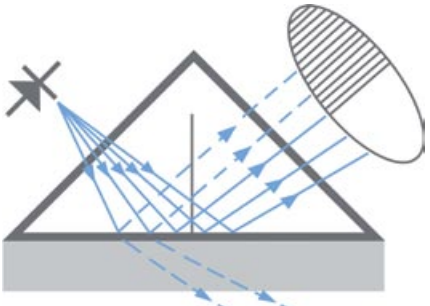
The light source sends light against the interface between a prism and the process solution, where the rays meet the surface at different angles.

Depending on the angle, some rays are totally reflected. Some rays are only partially reflected, and most of the light is refracted into the process solution. This creates an optical image with a dark sector and a light sector.



The angle corresponding to the shadow line is called the critical angle of total reflection. This angle is a function of the refractive index (the concentration of the solution.)

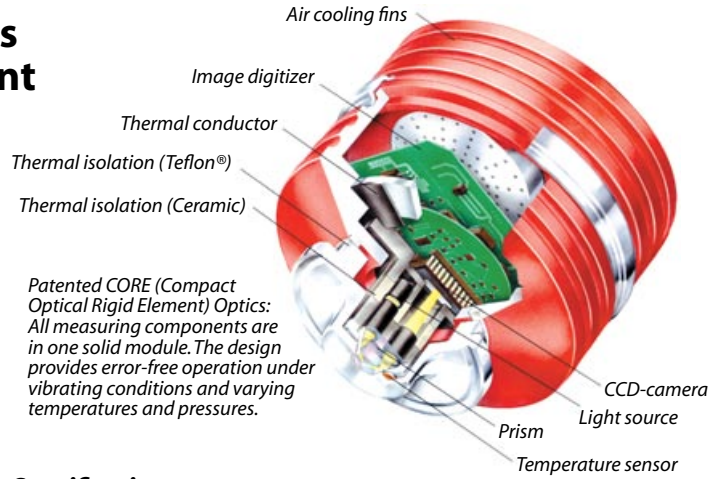
A digital CCD-camera detects the optical image and the shadow line. The camera transforms the optical image point-by-point to an electrical signal. The exact shadow line position is located, and the refractive index is determined.



A built-in temperature sensor measures the temperature (T) on the surface of the process liquid. The indicating transmitter converts the refractive index and temperature to concentration units.

The diagnostics program ensures that the measurement is reliable.

Sanitary In-Line Process Refractometers for Brix and Concentration Measurement


Air cooling fins
Image digitizer
Thermal conductor
Thermal isolation (Teflon®)
Thermal isolation (Ceramic)
Patented CORE (Compact Optical Rigid Element) Optics: All measuring components are in one solid module. The design provides error-free operation under vibrating conditions and varying temperatures and pressures.
CCD-camera
Light source
Prism
Temperature sensor

Features

There's a K-Patents sanitary refractometer designed for installation in just about any configuration you need — in a pipe bend, large pipe or vessel, flush mount in a cooker.

- Full measurement range of 0–100 Brix
- Accuracy ±0.0002 refractive index, corresponding to ±0.1% by weight; accuracy unaffected by particles, bubbles, or color changes
- Fast (5-second) temperature measurement and automatic temperature compensation by mathematical curve.
- All sensor optics in a rigid patented CORE-optics module with no mechanical adjustments.
- Once the sensor is calibrated to the desired range, there's no need to recalibrate.
- Effective heat transfer and isolation using Teflon® and ceramics in the sensor provide safe operation in higher process temperatures (to 302°F).
- Meets the 3-A sanitary standard requirement.
- Dual connectivity: One or two sensors can be connected to the transmitter module. Sensors are independent, with their own parameter sets and usable in different applications. Two current outputs configurable independently to indicate process concentration or temperature of either sensor.

Ordering Information: Sensor type and process connection, desired scale, properties of process solution, process temperature and pressure ranges, length of interconnection cable, supply voltage and frequency, options and accessories needed.

See the application datasheet at www.Lesman.com/datasheets.

Specifications

Refractive Index Range Standard: Full range 1.3100 to 1.5400 (corresponds to hot water 100 Brix) with spinal prism

Accuracy: R.I. ±0.0002 (corresponds typically to ±0.1% by weight); Repeatability and stability correspond to accuracy

Speed of Response: 1 second undamped

Damping Time Constant: Selectable up to 5 minutes

Calibration: With Cargille standard R.I. liquids over full range

Digital Image Detector: 3648 pixel CCD-element

Light Source: Light emitting diode (LED)

Temperature Measurement: Built-in Pt1000Ω sensor

CORE-Optics: No mechanical adjustments

Temperature Compensation: Automatic by mathematical curve

Ambient Temperature: *Sensor:* -4° to 113°F (-20° to 45°C)

Sensors

Sensor PR-23-A: *PR-23-AC:* Compact sensor model for small pipe lines, *PR-23-AP:* Probe sensor model for large pipe lines and vessels

Sensor: *Wetted Parts, Standard:* AISI 316L stainless steel, prism gaskets teflon, prism spinel; *Option:* Hastelloy C/ASTM C276, titanium/ASTM B348 GR2, nickel 200, tantalum, zirconium/Zr702

Process Connection: *PR-23-AC:* Sanitary 3A-clamp 2.5", Varivent® inline access unit clamp or via elbow flow cell, *PR-23-AP:* Sanitary 3A-clamp 2.5" or 4", or MT4 DN 25/1T APV tank bottom flange

Process Pressure: Sanitary clamp max. 200 psi at 70°F, 125 psi at 250°F

Process Temperature: *PR-23-AC:* -4° to 266°F (-20° to 130°C); *PR-23-AP:* -4° to 302°F (-20° to 150°C)

Sensor Protection Class: IP67, NEMA 4X

Indicating Transmitter DTR

Hazardous Area Classification: Zone 2 IIC T4 (KEMA No. EX-00.Y.1153); *Explosion-proof:* By purging

Display: 320 x 240 pixels graphic liquid crystal (LCD)

Keypad: 18 membrane keys

Current Output: Two independent current sources, 4-20 mA, max load 1000Ω. Galvanic isolation 1500V DC or AC (peak), hold function during prism wash

Power: AC input 100–240 VAC/50–60 Hz, optional 24 VDC

Alarms/Wash Relays: Two built-in signal relays, max. 250V/3A

Transmitter Protection Class: Enclosure IP66, NEMA 4X

Ethernet Connection: 10/100 Mbps, data acquisition over UDP/IP protocol with K-Patents PR-11111 datalogging software (included on request)

Interconnecting Cable: Standard 33 ft. (20m), max. 660 ft. (200m)

Options: Stainless steel sensor housing, prism wash, cable fittings to the indicating transmitter, European cable glands M20x1.5 or US conduit hubs

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

K-PATENTS PROCESS INSTRUMENTS

In-Line Process Refractometers for Liquids

Refractometer for In-Line Concentration Measurement of Liquids in Process Applications

Mounts in pipes or vessels for measurement in chemical, plastics, pulp and paper, and compound applications.

Features

- Full measurement range of 1.32 to 1.53 DI (0–100 Brix)
- Accuracy ±0.0002 refractive index, corresponding to ±0.1% by weight; accuracy unaffected by particles, bubbles, or color changes
- Fast (6-second) temperature measurement and automatic temperature compensation by mathematical curve.
- All sensor optics in a rigid patented CORE-optics module with no mechanical adjustments.
- Once the sensor is calibrated to the desired range, there's no need to recalibrate.
- Effective heat transfer and isolation using Teflon® and ceramics in the sensor provide safe operation in higher process temperatures (to 302°F).
- Dual connectivity: One or two sensors can be connected to the transmitter module. Sensors are independent, with their own parameter sets and usable in different applications. Two current outputs configurable independently to indicate process concentration or temperature of either sensor.
- Ethernet-based communications solution for real-time measurement data and diagnostics on your plant network. All you need is a cross-over cable and K-Patents' ready-to-install Java-based data acquisition software.

Specifications

Refractive Index Range Standard: Full range 1.3200 to 1.5300 (corresponds to hot water 100 Brix)

Accuracy: R.I. ±0.0002 (corresponds typically to ±0.1% by weight); Repeatability and stability correspond to accuracy

Speed of Response: 1 second undamped

Damping Time Constant: Selectable up to 5 minutes

Calibration: With Cargille standard R.I. liquids over full range

Digital Image Detector: 3648 pixel CCD-element

Light Source: LED, 589 nm wavelength, sodium D-line

Temperature Measurement: Built-in Pt-1000Ω sensor, linearization per IEC 751

CORE-Optics: No mechanical adjustments

Temperature Compensation: Automatic by mathematical curve, digital compensation

Ambient Temperature: *Sensor:* -4° to 113°F (-20° to 45°C); *Indicating transmitter:* 32° to 122°F (0° to 50°C)

Sensor (PR-23-GP)

Process Connection: Sandvik L clamp 88mm/DIN-flange 2656, PN40 DN80/ANSI-flange, 150lb, 3" JIS flange, 10K 80A/line sizes less than 2" via pipe flow cell

Process Temperature: -4° to 302°F (-20° to 150°C)

Process Pressure: Up to 350 psi (25 bar)

Wetted Parts: AISI 316L stainless steel, prism gaskets PTFE Teflon®

Sensor Protection Class: IP67, NEMA 4X

Indicating Transmitter DTR

Display: 320 x 240 pixels graphic liquid crystal (LCD)

Keypad: 18 membrane keys

Current Output: Two independent current sources, 4-20 mA, max load 1000Ω. Galvanic isolation 1500V DC or AC (peak), hold function during prism wash

Ethernet Connection: 10/100 Mbps, data acquisition over UDP/IP protocol with K-Patents PR-11111 datalogging software

Power: AC input 100–240 VAC/50–60 Hz, optional 24 VDC

Alarms/Wash Relays: Two built-in signal relays, max. 250V/3A

Transmitter Protection Class: Enclosure IP66, NEMA 4X

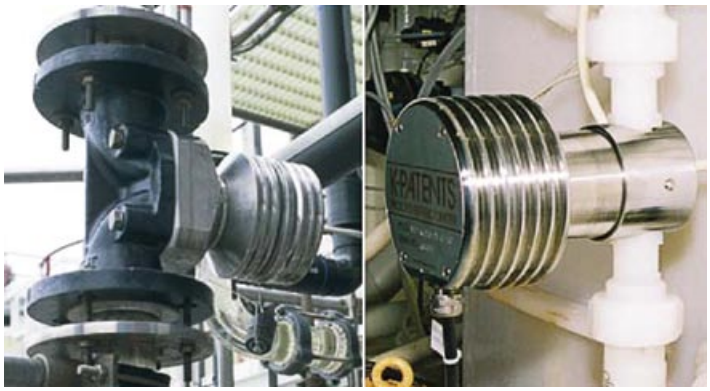
Interconnecting Cable: Standard 33 ft. (20m), max. 660 ft. (200m)

Options: Stainless steel sensor housing, prism wash, cable fittings to the indicating transmitter, European cable glands M20x1.5 or US conduit hubs

Ordering Information: Sensor type and process connection, desired scale, properties of process solution, process temperature and pressure ranges, length of interconnection cable, supply voltage and frequency, options and accessories needed.

Ready to order a K-Patents process refractometer? Complete the application datasheet from www.Lesman.com/datasheets and fax it to Lesman for an engineering review. We'll make sure you get the best system to fit your needs.

Process Refractometers for In-Line Concentration Measurement of Chemically Aggressive Liquids



These K-Patents models provide accurate means for measuring liquid concentrations in chemically aggressive solutions that corrode, foul, or otherwise destroy metal parts. The work equally well in ultra-pure fine chemical processes where metal parts can't be used.

K-Patents Teflon body refractometer PR-23-M is designed for small pipe sizes. The sensor wetted parts — Teflon, Kynar, Sapphire, Kalrez, and Spinel — are carefully selected because they have high chemical and mechanical resistance.

The AISI 316L sensor cover and polyamid 6.6 electrical connector withstand chemically aggressive gases and splashes of the process liquid..

The Saunders (diaphragm) valve body refractometer PR-23-W is designed for use in chemically aggressive solutions and ultra-pure fine chemical processes in large-scale production, and in large pipelines (2", 3", or 4" diameters).

It can be mounted in either a vertical or horizontal pipe. The Saunders body material is graphite cast iron, which provides a solid mechanical base for the sensor installation. The cast iron is lined with 3mm PFA fluoroplastic that gives the body its high chemical resistance. The sensor wetted parts are Teflon, PTFE, Spinel, and Sapphire. The sensor cover is AISI 316L stainless steel.

K-Patents' PR-23-W/M include an Ethernet-based communications solution that allows connection to computer networks (LAN) and the internet, to obtain real-time measurement data and diagnostic information. It also acts as a valuable service tool for parameter changes and software updates. All you need is a cross-over cable and K-Patents' java-based data acquisition software.

Like other models in the PR-23 series, the W/M models allow you to connect two sensors to a single indicating transmitter unit. Each sensor comes with a calibration certificate, comparing a set of standard liquids to the actual sensor output. The calibration and accuracy can be easily verified on-site with certified refractive index liquids and K-Patents' documented verification procedure.

Need a Brix table or the refractive index of a common material? See page 485.

Specifications

Refractive Index Range: *Standard:* Full range 1.3200 to 1.5300 (corresponds to 0–100% b.w.,) spinel prism; *Optional:* 1.2600 to 1.5000, sapphire prism

Accuracy: R.I. ±0.0002 (corresponds typically to ±0.1% by weight); Repeatability and stability correspond to accuracy

Speed of Response: 1 second undamped; *Damping Time Constant:* Selectable up to 5 minutes

Calibration: With Cargille standard R.I. liquids over full range

Digital Image Detector: 3648 pixel CCD-element

Light Source: LED, 589 nm wavelength, sodium D-line

Temperature Measurement: Built-in Pt1000 sensor, linearization per IEC 751; *Temperature Compensation:* Automatic, digital compensation

CORE-Optics: No mechanical adjustments

Ambient Temperature: *Sensor:* -4° to 113°F (-20° to 45°C); *Indicating transmitter:* 32° to 122°F (0° to 50°C)

Sensors

Process Connection: *PR-23-W:* Threaded G1/2" or 1/2" NPTF; *PR-23-M:* ANSI 2", 3", or 4" 150 lb flange; DIN DN50, DN80, or DN100 PN 16 flange

Wetted Parts: Teflon® PTFE prism gasket, spinel or sapphire prism, Kalrez O-ring, sapphire adapter

Process Pressure: 145 psi (10 bar) max.

Sensor Protection Class: IP67, NEMA 4X

Indicating Transmitter DTR

Display: 320 x 240 pixels graphic liquid crystal (LCD) with LED backlight and 8 membrane keys

Current Output: Two independent 4–20 mA sources, max load 1000Ω. Galvanic isolation 1500V DC or AC (peak), hold function during prism wash

Ethernet Connection: 10/100 Mbps, data acquisition over UDP/IP protocol with K-Patents PR-11111 datalogging software

Power: AC input 100–240 VAC/50–60 Hz, optional 24 VDC

Alarms/Wash Relays: Two built-in signal relays, max. 250V/3A

Transmitter Protection Class: Enclosure IP66, NEMA 4X

Interconnecting Cable: Standard 33 ft. (20m), max. 660 ft. (200m)

Options: Stainless steel sensor housing, prism wash, cable fittings to the indicating transmitter, European cable glands M20x1.5 or US conduit hubs

Ordering Information: Sensor type and process connection, desired scale, properties of process solution, process temperature and pressure ranges, length of interconnection cable, supply voltage and frequency, options and accessories needed.

See the application datasheet at www.Lesman.com/datasheets.

Illinois, Indiana, Missouri, and Iowa
Phone: 800-953-7626 • 630-595-8400
Fax: 630-595-2386

Lesman Instrument Company
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sales@lesman.com

Wisconsin, and Upper Peninsula Michigan
Phone: 800-837-1700 • 262-923-1790
Fax: 262-923-1797

Honeywell SmartCET Corrosion Monitoring System

Features

- Online, realtime corrosion monitoring — view corrosion data in the same context as process variables
- Usable information for both corrosion specialists AND operators: General corrosion rate, localized corrosion indicator (pitting), dynamic B-value, and corrosion mechanism index
- Works in low conductivity (where LPR can't) — ultrapure water, glacial acetic acid, and 98-99% hydrocarbon streams
- Totalized "super LPR" signal yields metal loss, like real-time electrical resistance
- Supported by Honeywell/Intercorr full lab services, consulting, and software
- Two-wire 4-20 mA transmitter with HART communications
- Standard 3/4" NPT process connection for insertion probe type
- Single and multivariable units available
- Transmitter compatible with probes from just about any manufacturer
- Specialized probes available for broader application support

Corrosion is eating your plant alive. What can you do about it?

Our customers tell us that because it's difficult to tie process conditions to corrosion rates, their ability to manage internal corrosion in plant infrastructures has been severely limited.

After-the-fact nature of traditional monitoring techniques like ER (electrical resistance), coupons, or inspection do not provide relevant data with which to make decisions on optimizing a process and limiting internal corrosion at the same time. Until now.

Realtime multivariable corrosion monitoring has unlocked corrosion data from the realm of the arcane specialist, and has thrust corrosion factors into the lap of plant operations. Gone are time-consuming evaluations of kurtosis and noisy ECN data.

Operators easily understand that high corrosion rates are bad and low corrosion rates are good. So, the SmartCET graphs show how easy it is to interpret "Super (corrected) LPR" general corrosion rate data and localized pitting factor trends with other plant processes. *(See some examples on the next page).*

The patented SmartCET transmitter forms the foundation for Honeywell's corrosion solution, uniquely providing online, realtime corrosion information that enriches the information in a process knowledge system. SmartCET delivers online corrosion diagnostic data and improved accuracy of corrosion rate data previously unavailable to the process control system.

SmartCET gives plant operators access to current, actionable process variable information, including a time-trended general (uniform) corrosion rate. It also provides an indication of localized or pitting corrosion detection. Localized corrosion accounts for approximately 70 percent to 90 percent of all corrosion-related equipment failures.

Embedded within SmartCET is our proprietary Super LPR (Linear Polarization Resistance) technology for measuring of corrosion trends. Super LPR couples LPR with two new Honeywell technologies for quicker and more accurate corrosion rate measurement and assessment of localized corrosion propensity. The result is that SmartCET is the only online, realtime product capable of accurately monitoring localized corrosion (pitting).

SmartCET measures corrosion from a sensor or probe that interfaces with the process environment. Proper configuration of the probe to suit the specific process environment is essential to ensure accurate corrosion detection. The unique design of SmartCET enables it to connect to a range of different off-the-shelf and custom probe designs, each configured to provide the most accurate and reliable measurement of corrosion activity.

Equipped with the appropriate probe, SmartCET with proprietary Super LPR technology allows corrosion monitoring to be available to virtually all plant equipment, regardless of material or operating conditions. Honeywell specialists can review your existing corrosion monitoring system and provide valuable input for optimizing this system and updating it for online, real-time monitoring.

SmartCET communicates via the HART protocol to easily connect to your existing control system. As an input to the process control system, corrosion data can be alarmed, historized, trended, and assigned to process groups. Corrosion data can seamlessly correlate with other process variables, so your corrosion specialist and plant operator or engineer can work together, each having a broader view of plant operation conditions and methods of mitigation.

The SmartCET multivariable transmitter, CET5000M, can detect general corrosion and localized corrosion (pitting) in real time, connecting to a distributed control system or process knowledge system via a 4-20 mA signal and compatible HART protocol.

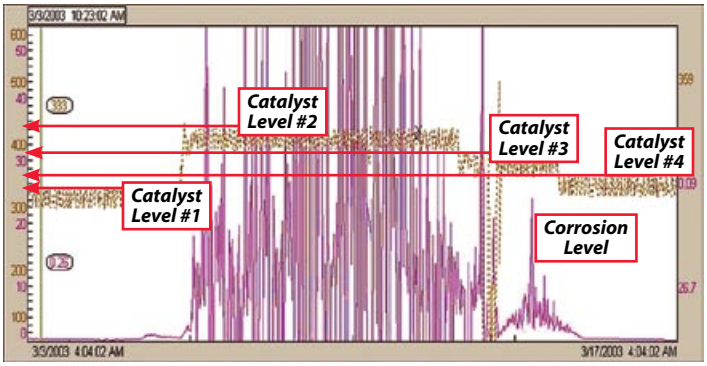
The CET5000M provides four outputs - for general corrosion rate, an indicator for localized corrosion (pitting factor), Stern-Geary constant (B-value), and fourth variable to help diagnose the corrosion mechanism.

SmartCET executes on a seven-minute measurement cycle and performs an automated electrochemical noise (ECN) measurement along with the standard LPR technique. To further enhance accuracy, harmonic distortion analysis is applied, making a calculated B-value based on the actual process conditions available. The default B-value is stored in the transmitter and can be changed.

Corrosion Facts and Figures

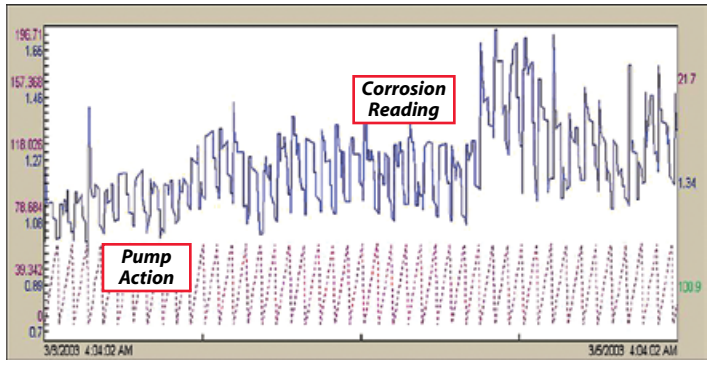
- Corrosion is a key cause of costly process downtimes — Online corrosion monitoring can help shift the focus away from costly corrective maintenance, and towards preventive and predictive maintenance
- US government and industries spend $276 billion dollars per year to combat corrosion —and it's increasing due to aging plants, sour crude stock, and higher throughputs
- NIST studies show that 40 percent of these costs can be avoided by using online corrosion monitoring systems
- 90 percent of all corrosion damage is caused in only 10 percent of the time — Offline corrosion monitoring approaches can't adequately identify root causes
- Traditional corrosion monitoring is typically done off-line and historical — Viewed in intervals of weeks or months, long after the damage has occurred
- 70 to 90 percent of all corrosion-based failures are due to "local" corrosion — Traditional approaches can't detect local or pitting corrosion

What Can You Learn from Real-Time Corrosion Monitoring?



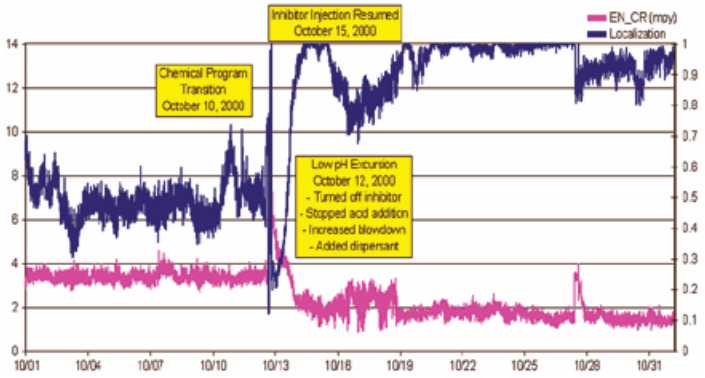
Changes in catalyst feed rates influence corrosion rates.

You can see exactly how the catalyst levels affect the corrosion rate of this carbon-steel piping — and fine-tune the catalyst feed to bring the corrosion rate back to zero.



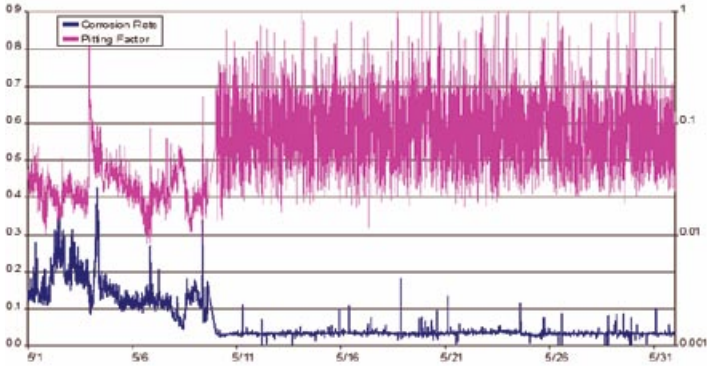
Corrosion rates spike when a vessel pump turns on.

When you see the dramatic spike in corrosion caused by a vessel's pump-down schedule, you can adjust the number of turns to reduce corrosion and extend the life of your equipment.



Realtime monitoring points to the source of problems.

In this example, taken by monitoring chemical treatment in cooling water, you can see the impact of operational changes on corrosion rates. A low pH event after changes to the chemical system on October 10th caused an increase in corrosion rate. Within 24 hours, the system showed the start of a pitting problem. Corrosion inhibitor injection was restarted on the 15th, correcting the general corrosion rate. But, the pitting activity continued to increase.



General corrosion and pitting can occur at different rates.

In this example, events early in the month caused both the general corrosion rate and localized corrosion (pitting) to be high and inconsistent. And, even though general corrosion seems to be under control after the 10th of the month, an area of localized corrosion has been created, and the effects there are becoming worse over time.

Specifications

Output Signal: 4-20 mA signal (two-wire) with HART

Supply Voltage: 9-30 VDC

Operating Voltage: Min 9 VDC at max loop current 2-wire (4-20 mA)

Load (with 24 VDC power supply): 680Ω max. with high alarm capability; 750Ω max. without high alarm

Linearity: 0.0015% non linear

Resolution: 17 bit

B Value: 25.6 mV (default)

Operating Temperature: -40° to 158° F (-40° to 70° C)

Process Temperature (Max.): *316 Stainless Steel Probe:* Direct Mount: 250° F (121° C); Remote Mount: 500° F (260° C) peak, 400° F average; *Glass Epoxy Probe:* 150° F (65° C)

Process Pressure (Max.): 3600 psi (245 bar) 316 stainless steel, retrievable probe double sealed; 1500 psi (102 bar) 316 stainless steel probe double-sealed; 100 psi (7 bar) glass epoxy probe

Physical Specifications

Materials: *Enclosure:* NEMA 4X Aluminum; *O-Rings:* Viton®

Connections: *Process:* 3/4" NPT (for insertion probes); *Electrical:* 3/4" NPT; *Wiring Terminal:* Accept up to 1.5mm - 14 AWG

Mounting: Probe mounts direct on process pipe, transmitter can be direct or remote mounted to probe

Approvals: CSA (Canada and US) Class 1 Div 2, Groups A-D; CSA Intrinsic Safety Class I, II, III; Div 1 Groups A-G; CE Mark; ATEX

Need help selecting the right corrosion transmitter for your process? Fill out the application questionnaire at www.Lesman.com/datasheets and fax it to Lesman for a process review.

Illinois, Indiana, Missouri, and Iowa
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Fax: 630-595-2386

Lesman Instrument Company
www.lesman.com
sales@lesman.com

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7866 Analyzer System for Hydrogen Gas Purity

Optional sampling system available. Call Lesman.

Replaces your L+N analog analyzer

- Factory configured for hydrogen purity applications, providing continuous sample analysis during start-up, shut-down and operating cycles
- Easy-to-read display with digital readout of gas concentration and indication of the monitored range.
- Rapid response sensor provides immediate indication of any process change
- Control unit packaged in corrosion-proof aluminum case; Sensor in explosion-proof, cast aluminum housing
- Remote indicator displays concentration and range
- Individually set high and low alarms

Ideal for Triple Range Hydrogen Installations

Range 1: Purge **Range 2: Fill** **Range 3: Operating**

The Honeywell 7866 Thermal Conductivity Analyzer is designed to provide highly sensitive and accurate analysis of a binary mixture of gases. The analyzer consists of three basic components: the sensing unit (transmitter), the control unit (receiver) and a power supply.

The sensing unit receives a continuous flow of the binary or multicomponent gas mixture, measures the concentration of the sample gas and transmits an electrical signal to the control unit. It is ruggedly constructed to meet most environmental conditions. It is designed to be mounted up to 1,000 feet from the control unit with only a single multiconductor non-shielded cable connecting the two. The result is greater flexibility and lower installation costs.

The control unit is designed for simplified panel-mounting either at the sampling site, of environmental conditions permit, or in a control room. It provides a current output signal to a remote device for monitoring or recording. The controller comes with one or two alarms that can activate an external annunciator or a relay to initiate shutdown.

An annunciator model, which provides a continuous readout of the gas concentration is available with the triple range 7866 analyzer. The remote indicator has no direct connection to the sensing unit.

Specifications

Accuracy: ±2% of span (output signal) at reference conditions for binary gases

Linearity: Within ±2% of span for most standard ranges. If linearity exceeds ±2%, a correction curve is supplied

Short Term Repeatability: ±0.3% span; *24 Hour Reproducibility:* ±1% span

Response Time: *Maximum for 4 cfh (2000 cc/min) Flow for H2:* Initial: less that one second, 63%: 13 seconds, 90%: 23 seconds, 99%: 40 seconds; *For CO:* Initial: less than two seconds, 63%: 13 seconds, 90%: 45 seconds, 99%: 80 seconds

Zero/Span Drift: ±2% of span per week maximum

Measuring Range: Range 1 measures CO_2 in air, Range 2 measures H_2 on CO_2, Range 3 measures H_2 in air

Output Ranges: *0-20 mA:* 800Ω max.; *4-20 mA:* 800Ω max.

0/4-20 mA Output: *Range 1:* 0 to 100% CO_2 in Air; *Range 2:* 0 to 100% H_2 in CO_2; *Range 3:* 0 to 100% H_2 in Air

Alarm Outputs: One or two SPDT electromechanical relays

Sample Requirements: *Flow:* 0.2 to 4.2 cfh (100 cc/min to 2000 cc/min); *Pressure:* 37mm Hg (20" H2O) min. (with filter and flowmeter)

Materials (Contacting): 316 Stainless Steel, Buna-N, Teflon, glass and Viton

Power Requirements: *Control Unit Only:* Universal supply 90 to 264 VAC or 24 VAC/DC; 50 Hz to 60 Hz

Communications: Two-wire multidrop Modbus RTU, 15 drops max or up to 31 drops for shorter link length; 4000 feet max; 2400, 4800, 9600, or 19.2K baud rate

Connections: *Sample Inlet/Outlet:* 1/4" OD tubing; *Reference Gas Inlet/Outlet:* 1/4" OD tubing; *Power Inlet:* 1/2" conduit opening (control); 1/2" NPTF (sensing unit)

Sensing Unit Enclosure: Approx. 6" x 6" x 12-3/4"; *Approvals:* NEMA 7; FM/CSA Approved Class I, Div 1, Groups A-D; Class II, Div 1, Groups E-G; Class III, Div 1; T6@T_A =50°C; Enclosure Type 4 (All conduits must be sealed within 18")

Control Unit Enclosure: *Bezel:* 3.78" square; *Case:* 3.62" H x 3.62" W x 7.55" D

Ordering Instructions

Select the key number and options you need. A finished catalog number looks like this: 07866_ _ _ _ - _ - _ - _ _ _ - _ - 000 - _ _ _

Model Selection Guide

Description		Catalog Number	Availability				Price
7866 Digital Analyzer for Hydrogen Purity Includes 07866DHS2 Sensor Assembly and 07866DHC2 Digital Control Unit		07866DHH2	↓				$8915.00
7866 Digital Control Unit Replacement		07866DHC2		↓			2745.00
7866 Digital Remote Range Indicator		07866DRRI			↓		1080.00
7866 Sensor Assembly Replacement Electronics		07866HHSS				↓	4110.00
Sensor Power Supply	None	0		•	•	•	0.00
	Input: 105-125 VAC, 50-400 Hz	2	•	•			175.00
	Input: 210-250 VAC, 47-520 Hz	4	•	•			200.00
PV Output Range	None	0			•	•	0.00
	0-20 mA	1	•	•			0.00
	4-20 mA	2	•	•			0.00
Communications	None	000	•	•	•	•	0.00
	RS422/485/Modbus	101	•	•	•		305.00
	10 Base-T Ethernet (Modbus RTU)	102	•	•	•		305.00
Configuration	None	0-000			•	•	0.00
	Use Without 07866DRRI Indicator	1-000	•	•			0.00
	Use With 07866DRRI Indicator	2-000	•	•			0.00
Tagging	None	000	•	•	•	•	0.00
	Stainless Steel: 3 Lines, 15 Char/Line	208	•	•	•	•	35.00
Accessories	Spare Power Supply, 110VAC	51450915-501	•	•			397.00
	Spare Power Supply, 220VAC	51450915-502	•	•			456.00
	DIN Adapter Plate	30755223-003	•	•	•		60.00